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THE  
AGE OF MAN

GEOLOGICALLY CONSIDERED

IN ITS BEARING ON

THE TRUTHS OF THE BIBLE.

BY

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## P R E F A C E .

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VERY many ordinary readers know little, if anything, of geology. A large proportion of those whose happiness and hope depend on their belief in Jesus Christ, live at a great distance from what may be called the border of science. They know that there is a region of thought in which some of their fellow creatures dwell, within which things are known that cannot be discovered or even well understood in the homely fields of common learning. They have no time, or, having time, they have not the means of crossing the border into this region so as to discover and understand for themselves. They are not discontented on account of this state of affairs, having that knowledge which the Bible furnishes so fully to the most humble mind, and being perfectly satisfied that the scientifically favoured of mankind should enjoy their superior advantages and bear their heavier responsibility. So long as there is no hostile crossing from the one region to the other—so long



as men of science allow the ideas of scriptural religion to remain intact, and men of gospel views allow scientific inquiry to have the freest scope—all goes peacefully. This, however, is not always the condition of parties. It is far indeed from that condition at the present time. Very strong detachments from the land of science have come across to inform the believers in Christ that evidence has been found which proves that the Bible, on the truth of which Christianity depends, is utterly untrue. It is not wonderful if at such a season some Christians should cross into the regions of science for the purpose of judging of this evidence for themselves, and reporting to those who have not the opportunity of personal investigation. It is as one of these intruders, justified in his intrusion he thinks because of the previous intrusion of scientific men on gospel ground, that the writer of the following pages has been led to publish the result of his observations. He does not profess to live in the geological territory, though he has very frequently paid visits there; but he has been induced to go over at this time on an excursion of earnest and painstaking observation, that he might investigate for himself the alleged evidence on which the Blessed Old Bible has been so hastily condemned, and he is desirous to report the result of his investigations. This will give the

reader some idea of the little volume which he is invited to peruse. The writing is not that of a professed geologist, but neither is it that of one who has refrained from an examination of the facts and principles of geology. The little treatise is directed chiefly against Sir Charles Lyell's larger work on the Antiquity of Man, only because Sir Charles is the great representative of the views which are so hostile to the Sacred Scriptures. His volume contains nearly all that can be said on that side of the subject. It is humbly hoped that those who condescend to read the following chapters carefully will find that some good measure of positive truth is communicated, while no small amount of misleading speculation is removed.

J. K.

EDINBURGH, 17th March, 1866.

# CONTENTS.

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	PAGE
CHAPTER I.	
Ignorance and Error, ... ..	9
CHAPTER II.	
A Grave Consideration, ... ..	21
CHAPTER III.	
The Nature of our Inquiry, ... ..	28
CHAPTER IV.	
Principles of Interpretation, ... ..	37
CHAPTER V.	
The Vision of Creation, ... ..	46
CHAPTER VI.	
Our Chief Subject, ... ..	61
CHAPTER VII.	
The Argument from the Growth of Peat, ... ..	67
CHAPTER VIII.	
The Argument from Mud, ... ..	79
CHAPTER IX.	
The Contraction of Lakes, ... ..	90
CHAPTER X.	
Beds of Gravel and Sand, ... ..	101
CHAPTER XI.	
Formations from Ice, ... ..	116
CHAPTER XII.	
The Glacial Period, ... ..	130

	PAGE
<b>CHAPTER XIII.</b>	
Upheaval and Subsidence, ... ..	140
<b>CHAPTER XIV.</b>	
Deposits in Caverns, ... ..	155
<b>CHAPTER XV.</b>	
The Argument from Trees, ... ..	169
<b>CHAPTER XVI.</b>	
Extinct Mammalia, ... ..	182
<b>CHAPTER XVII.</b>	
The Argument from Shells, ... ..	194
<b>CHAPTER XVIII.</b>	
The Cyrena Flumenalis, ... ..	201
<b>CHAPTER XIX.</b>	
The Argument from Skulls, ... ..	211
<b>CHAPTER XX.</b>	
The Argument from Languages,... ..	223
<b>CHAPTER XXI.</b>	
Men Compared with the Lower Animals, ... ..	234
<b>CHAPTER XXII.</b>	
Brevity of History, ... ..	243
<b>CHAPTER XXIII.</b>	
Conclusion, ... ..	257



# THE AGE OF MAN.

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## CHAPTER I.

### IGNORANCE AND ERROR.

If one is really well-informed on any subject it is not easy, if it be even possible, to mislead him by means of it. But ignorance presents a most favourable condition of all sorts of error. It is consequently one of the highest duties of all who love mankind to seek to give their neighbours knowledge on all important affairs, and it is one of the most sacred of privileges to take advantage of all true information which is brought within our reach. If we would fortify the young, or defend those more advanced in life, from the dangers of error on the most precious of all topics, we must labour to inform, and those to be defended must not grudge the efforts necessary to the acquirement of all thorough knowledge. The labour given on this principle will not only secure its reward—it is necessary to our protection from the worst evils that befall the human race.

It is chiefly the profound ignorance prevailing among the great mass of the people which gives

place to those misleading notions that destroy to so great an extent that faith which is essential to real happiness and true virtue. It is not science, which is knowledge, but the opposite of science, which is simply ignorance, which must be combated and removed. When men speak of "scientific culture," as if it called for ideas on religion subversive of the most valuable beliefs entertained by human beings, they do great injustice to real science. They speak in view of that proud but most superficial imagining by which one fancies himself almost the monopolist of natural truth, when he is in possession of little more than a few meaningless phrases, behind which ignorance conceals itself—chiefly from its victim. We shall have some striking illustrations of this as we proceed.

Among the comparatively uneducated the absence of information on what are called scientific matters, and even on those subjects that can scarcely be ranked as such, is almost incredible. The idea that "the world goes round," is utterly strange to a great mass of our labouring millions. They are familiar with the sound of words whose real meaning implies that this solid earth revolves, but they have no more conception that such is really the case, or that we are standing feet to feet with our antipodes, than they believe that we are placed head to head with them. We well remember two rather knowing men of their class who had been hearing an eloquent sermon, in which the preacher had rather freely discoursed astronomically. One of the men was enchanted apparently with the "ability" of the oration. He

spoke very strongly in praise of it, when the other interrupted him by saying, "But you don't believe what he said." "Yes, I do," replied the admirer. "No, you don't. Do you believe that the world goes round?" "No, I don't," was the reply. "But he said so." "Well, I'll never believe that," said the other, "for that thorn tree has stood on that hill top, exactly where it is now, since ever I can remember." Nothing would dislodge him from that faith—at least so he thought. We shall see that as flagrant ignorance as this, though on other points, prevails in the best informed minds ere we have done with our present task; but no one can estimate how deep and dense is the mental darkness which is allowed to enshroud the general mind. The schoolmaster in his ordinary labours does not remove it. During the time in which he has to deal with those who form the great mass of the rising generation he cannot reasonably be expected to do so. We remember a very well instructed person just escaped from the restraints of school in an inland little town, who had been visiting a seaport, and saw there the steamers with their "wheels" lying in the river. She said she wondered what they would do when they came to deep water! She imagined that all "wheels" must have a road to run on, and when the bottom of the river or sea got too far down she thought it must be all over with the paddles! No great wonder if one situated as she was did not quite comprehend the whirling of worlds in space, when she had not yet mastered the idea of a paddle-wheel's motion in the sea. But it must not be inferred that this young person was ignorant



of such subjects as had been fairly brought within her reach. She was a very superior person of her age and class. Observant in a high degree, she was well acquainted with many things within the domain of natural science. We could stake a good deal on the assertion that she would have beat Sir Charles Lyell himself, if called to speak, on the subject of the growth of peat. We shall see how that matter stands with the worthy baronet when we come to it in its proper place.

It would be a great mistake, however, to assume that lack of knowledge prevails only among those who are regarded as the comparatively "uneducated" in society. What are called "the labouring classes," are not less informed as a whole than are the "trading classes," who are considered a great step higher in the social scale. The manual labourer gathers knowledge on the subjects that come under his observation, and the commercial man becomes acquainted with those subjects that lie along his path; but both the labouring and the trading classes, taken in the aggregate, remain almost totally ignorant of those greater and more general subjects, such as geology, that are laid out, not for a class, but for all who love and earnestly follow after knowledge. Even the men whose pecuniary interests and daily bread depend to a large extent on their geological knowledge, remain in astonishing ignorance of the laws which regulate the natural processes with which they have most intimately to do. Mr. Wallace, in his admirable book on "The laws which regulate the deposit of lead in veins," &c., tells us the sentiments of the most experienced miners—men

occupying the highest places in what one would think the most advantageous of all walks of life for the acquirement of geological information. Mr. Wallace says, "Even some occupying high distinction as directors or proprietors of mines affirm, without qualification, that it is impossible to see through solid rocks; or they summarily dismiss further consideration on the subject by remarking that the old adage, current among miners, expresses an important truth, namely,

"It is only by cutting the ground,  
That the metal is found."

The Cornish miners express their doubts by a similar phrase—

"Where it is, there it is."

If these are not the apology of indolence and ignorance," says this clear-headed author, "they certainly are the utterances of despair." Many many thousands of pounds sterling, representing an immense amount of labour, have been thrown away in fruitless mining, on account of this same lack of knowledge. When such is the ignorance reigning in the minds of the most intelligent and experienced of even first-rate men, it need not surprise us that such ignorance of the earth's construction is profound among the great mass of even the mining population, and that it is dense as Egyptian darkness itself among the other classes who form the great bulk of society. Amid such ignorance all error which is founded on geological statements, or fortified by strong geological assertions, has a soil most thoroughly prepared for its growth.

Nor must it for a moment be supposed that the labouring and trading classes are alone in their ignorance, or that that ignorance respects such subjects as geology alone. We remember a clergyman, who was trained at one of our great English universities, and who himself personally knew the parties concerned in the fact, telling us of a student, grown up to manhood, who was undergoing an examination intended to test his knowledge, not of geology, nor of any other "deep" subject, but of the plainest matters of record in the Bible. He was asked who were Shadrach, Meshach, and Abednego. He replied, "Shadrach, Meshach, and Abednego, were three great prophets of the Lord, whom Moses took and hid by fifties in a cave, and the ravens came and fed them with bread and milk in the mornings, and with bread and milk in the evenings, and they rejoiced with exceeding great joy!" As our informant said, the poor fellow gave all the Bible ideas he had in that one answer, and he put them together as best he could. We cannot imagine that any answer given in a collier's cottage during the darkest times of our peasant population could be found to beat the ignorance of this which was given by one who was favoured with the highest advantages that are enjoyed in our favoured land. No doubt it may be said that we give exceptional cases only, and that these do not prove a general rule, but to those who are well acquainted with the state of the general mind the cases will be representative rather than exceptional. It is the greatest folly to imagine that one class of the people may look down upon another in the matter. It is judicious

silence alone that hides an immense amount of ludicrous misconception existing in the general mind. If you ask, for example, the great majority of ordinary people whether the reservoir from which a spring of water comes is down below or up above the spring itself, you will be told that it must be below! It will be found very difficult indeed to persuade them that it is otherwise.

Yet this is not the most serious part of the case. If those who occupy the place of teachers to the mass of the people were thoroughly informed on those subjects of which the enemy of truth is ever ready to make the utmost use, error would be placed at a much greater disadvantage. The criticisms of a large portion of the press, both secular and religious, on such works as that of Sir Charles Lyell on the Antiquity of Man betray the most amazing bewilderment on the part of the critics when dealing with the real pith of the subject in hand. The pulpit fails almost as signally as the press to meet such terrible error on its own chosen ground. Those who have given themselves to what is understood to be strictly theological investigations, when confronted with such an array of facts as Sir Charles advances, apparently proving that man has been some half a million of years on the earth, instead of being ready to repel the monstrous fancy with the confidence of well-informed geologists, are ready to make the most fatal admissions, and so to yield the solid ground to the enemy while they take refuge behind some imaginary principle of reconciliation between the dreams of so-called science

and the everlasting teachings of sacred writ. A theory of exposition founded on conjecture is adopted as a means of evading the destructive conclusions of the scientific foe of the Bible. As this theory is imagined in ignorance of the real facts in the case, it is sure to be defective. It is, indeed, a "lying refuge." Often when such a refuge is exposed to even a very slight examination, it is found to be flagrantly inconsistent alike with the facts of geology on the one hand, and with the Scripture record on the other. As an example, we have the notion to which some flee, that the creatures using the stone hatchets of "the drift," as it is called, were not "*men*" in the Bible sense of the word! They are thought of as a race, or as many races of beings who were so far above apes and gorillas as to be capable of chipping flints into knives, spear heads, and hatchets, yet not *men*, or immortal beings as Adam was. It is not thought of that this theory might shut us up to regard the aborigines of Australia, who have used, and even still use, weapons and tools of stone, as not fellow-creatures of the human family at all. It is not seen how far this would carry us as to the proper humanity of the negro, for instance, or of other races of men. Above all it is forgotten that every false method of reconciliation is apt to lead only to greater divergence. All such attempts to remove discrepancies raise greater difficulties than they quell. All such methods of reconciliation as seek their foundations in mere conjecture are refuges of helpless ignorance, coupled sometimes with indolence such as makes a man content to have no better defence for even his highest inter-

ests, wrapt up as these are with the truth of the Book of God.

It is when such a state of things prevails that efforts like those represented by the notorious "Essays and Reviews" produce their most disastrous results. The multitudes into whose hands such productions come are in a great measure at the mercy of their authors. They are so because of ignorance, and for lack of well-informed instructors who might at once show, not only the bad theology, but the still worse geology of the opponents of inspiration. We are in the warfare of thought very much as men are in the warfare of the sword at the present day. The progress of discovery is so rapid that weapons which were of the greatest service, and armour which was impenetrable a very few years ago, are now nearly useless. Tactics which were sufficient to baffle every foe of a warlike race, but a very few years since, would now serve only to secure the speedy discomfiture of those who should depend on them. Ideas of nature that were regarded as never to be disputed by some of the best informed among us in 1864, are demonstrated to be false already. The notion, for example, that metallic ore was a deposit from gases, or vapours, rising from the interior of the earth, and condensed in the veins and chambers in which they are found, was regarded as a settled conclusion of science. It is now so thoroughly refuted that we can scarcely imagine any man, who has examined the literature of the subject, as retaining a fragment of the idea. The notion that granite is an igneous formation, crystalised under immense pressure in the depths

of earth or ocean, which Sir Charles Lyell himself speaks of as the prevailing geological opinion even in his last edition of the "Elements of Geology," published in 1865, is giving way to another theory, if not to the facts of the case. Amid all this change, knowledge—real knowledge—is rapidly increasing in the minds of all who keep pace with discovery. The best progress is really being made, and we ought to rejoice at the change which is exploding every error only to establish the truth. But the enemies of the most precious of all truth fasten eagerly on all that is shown to be false, and hold it up as evidence of the perishable character of that knowledge which will last while God himself remains. The great thing demanded of us is to be able to hold up the eternal verity of the saving knowledge of God, over the ruins of all that can possibly be removed from the mind as untrue. In order to this we must follow the enemy into all his strongholds and hiding-places, and show that we are as much at home where he lurks as he can possibly be. We shall find that he is then affected somewhat as the would-be ghost was in the church-yard. A fellow who was desirous to frighten some one by his appearance in a white sheet, took his station on a grave-stone one night duly wrapped in his snowy covering. A cunning wag, who had got a hint of the affair, provided himself with a sheet also, and having added some other ornaments of a ghostly nature to his habiliment, stole unperceived into a space beneath a tomb-stone at some little distance from where his brother-ghost sat down to wait for his victim. By causing some unusual sounds to

issue from his hiding-place, he raised the wonder if not the fear of his neighbour. When he had fairly drawn attention to the spot where he lay, as the story goes, this ghost, who had undertaken to lay a ghost, began to issue slowly, as if coming out of the ground. A strange creeping sensation stole over the head of the merely earthly being, as he saw what he took for one of an unearthly nature coming to keep him company. He was not long in concluding that there was one too many in white there that night, at least for his consolation, and he made his way as fast as his heels could enable him to the land of the living. He had more than enough of the dead. The ghosts of imaginary science by which so many are frightened out of their confidence in the Bible must be treated in this way. But this can be done only by our having the courage, and taking the trouble to go into their places of hiding and dislodge them. This again can be done only by our mastering in some degree the science of which they take advantage, and bringing it within the reach of all who will either read or hear so as to become well-informed. It is ignorance, not science, of which we have reason to be afraid. It is the indolence on which ignorance thrives, which is really our greatest obstacle in such a work—that indolence which is delighted with a piece of trifling fiction, or pleased with some other equally unsubstantial sentimentalism, but cannot bear the “dry work” of informing itself on the most momentous questions of truth. We must contend with this indolence, and seek to rouse the general mind to an interest in that knowledge which is not only



delightful in itself, as all science is, but which is needed to place us on an equal footing with those who use the facts of science in a way which leads to the destruction of Christian faith.

## CHAPTER II.

## A GRAVE CONSIDERATION.

A FEAR has been very strongly expressed of late years lest the "educated classes" should withdraw from the influence of religion. In view of the possibility of this, Professor Jowett says—"It is a grave consideration whether we ourselves may not be in an earlier stage of that religious dissolution which seems to have gone further in Italy and France."\* Mr Jowett, and those who sympathize with him, seem to think that the best way for preventing this "religious dissolution" is to put an end to any remaining belief which these "educated classes" may have in the truthfulness of the Bible. Speaking of the first chapter of Genesis, Mr Goodwin remarks that "It can scarcely be said that this chapter is not intended in part to teach and convey at least some physical truths, and, taking its words in their plain sense, it manifestly gives a view of the universe adverse to that of modern science."† The essay in which these words occur is an elaborate effort to prove that the narrative of Scripture is utterly untrue, and that no "educated" mind can regard it as otherwise. By "educated classes" we presume

\* "Essays and Reviews," page 454, small edition.

† Ibid, page 251.

are meant those who pass through a course of mental training such as is not required to fit the peasant nor even the commercial man, for his place and work in the world—those who are fitted for what is called “professional life,” or for that place in the world which is occupied by the ruling portion of the community. He must fancy that these classes are becoming geologically educated, and geologically educated in the same sense as he himself seems to be—that is, just so much as is sufficient to unsettle a very flimsy belief in the inspiration of the Bible, by means of an almost equally flimsy knowledge of the structure of the earth and kindred subjects. The real state of things among these so-called educated classes, who delight in the “*Westminster*” and patronize the “*Essays and Reviews*,” is characterised by ideas on every subject, religion included, that float upon the surface and fail to embrace any of the solid elements of truth. They have a dreamy science so-called on the one hand, and an equally dreamy religion on the other. Between the two they spend a dreamy life, disliking to be awaked from their delusive enjoyment of the world by the stern realities of the Book of God, and equally disliking the relentless demand of science for patient work and severe logic. It is in favour of such a state of mind that the attempt is made to dislodge the Word of Life for man from the popular faith, except as each man may see fit for himself to retain any portion of it. In so far as such an attempt is successful can there be any other result possible than that of the ultimate withdrawal of all classes from the Bible? And if men must

withdraw from the Bible, to what other quarter shall they turn for "religion"? The wish of those writers seems to be that we should give up the idea that the Bible teaches us correctly on certain subjects, in order to the continued belief of the educated classes in something which shall remain as "religion" when our old views of Scripture authority have fled.

For the purpose of illustration on this momentous point, let us suppose, for the moment, that we allow all matters of merely physical creation to fall aside as not of such a nature that we might expect a revelation from God regarding them, and that we allow all other matters of a historical and doctrinal nature to be in abeyance along with them. Let us come down to the very last matter, not of religion only, but of bare morality to which it is possible to descend. That will surely be admitted to be simple veracity. Professor Jowett says—"It would be a strange and almost incredible thing that the gospel, which at first made war only on the vices of mankind, should now be opposed to one of the highest and rarest of human virtues—the love of truth."\* Well, then, let us look into the effect to be expected from the prevalence of Professor Jowett's own teachings, and those of his fellows, on this very matter, which is certainly not the "highest" if it should be the "rarest" of human virtues, seeing it is that fundamental element without which there can be no virtue whatever. What is to become of even *this*, if we are at liberty to pick and choose from the Bible as each of us may see fit? A coadjutor

\* "Essays and Reviews," page 453, small edition.

of Mr Jowett—Mr Bristow Wilson, says—"As to abstruse points of doctrine concerning the divine nature itself, these subjects may be said to be beyond the reach of our faculties ; if one says 'aye,' no one is entitled to say 'no' to his 'aye;' if one says 'no,' no one is entitled to say 'aye' to his 'no.'"\* Here, then, we have "abstruse" matters placed on the shelf, and one which is not abstruse placed on the table. That simple subject is, as we have said, mere truthtelling. Suppose that we leave all these "abstruse" matters, for the time, and that we look to the one affair of truthfulness only. "The educated classes," and all others who have been loosed from their faith in Bible history turn, we shall suppose, to men of science for instruction on this cardinal virtue. Another coadjutor of Mr Jowett, Mr Goodwin, furnishes a striking instance of how such men regard it. When speaking of the "difficulty" (in points of truthtelling, we presume,) arising in view of a sacred writer's asserting, "so solemnly and unhesitatingly, that for which he must have known he had no authority"—this writer says—"The early speculator was harassed by no such scruples, and asserted as facts what he knew in reality only as probabilities. But we are not on that account to doubt his perfect good faith."† Here then is a sample of the "morality" which is to be left for the benefit of the "educated classes" and others, whose faith in the truth of Bible history is to be dissolved, that they may not withdraw from "religious influences!" These

\* "Essays and Reviews," page 188, small edition.

† Ibid, page 304.

classes are to be taught that they are not to doubt the "perfect good faith" of a man who solemnly teaches what he does not know to be true! They are consequently to regard themselves as speaking in "perfect good faith," if it suits them at any time to assert as facts what they know only as probabilities! Does not this show us, beyond the possibility of a doubt, that, even in so palpable a matter as that of sterling veracity, if we give up the divine authority of the Book of God, we surrender the only one bond that can bind society together in a far more momentous sense than that which is found in the adhesion of what are called the "educated classes" to the current "religion"? The wealthier thousands might desert the churches, and it would be a great evil no doubt; but it would be trifling indeed, when compared with the consequences to be looked for if the millions should lose their confidence in the truthfulness of the Bible, so that they should have no better standard of even honourable truth-telling itself than that of which we have here an instance.

We are far from sympathising with Mr Jowett's alarm as to the French and Italian dissolution of religious bonds, which he dreads as already, perhaps, going through its earlier stages in this country; but we are at ease chiefly because the Bible is so much more fully known and revered in Great Britain than in any Romish land. If he and his coadjutors were to succeed in loosening general confidence in the truthfulness of the Bible, as that confidence has been loosened in France and Italy, then we might look for the dissolution spoken of, but not till then. We urge this grave

consideration in order to impress the solemn truth upon our reader's mind—that the subject we have in hand is not one of abstruse doctrines merely, nor is it so chiefly. It is in reality one of submission or non-submission to that standard of belief and life which is supplied us by our Creator; and there is involved in that the bond of divine social law by which alone the individuals and families of human beings on earth can be bound together in civilised and prosperous union. That common standard from which alone we can authoritatively reply even to Pilate's question—"What is truth?"—is dependent for its existence with us on the truthfulness, or perfect accordance with reality, of the Bible. If the love of truth, and consequently truthfulness, even in those who are employed by God himself to reveal his mind to men, is consistent with the solemn and unhesitating assertion of things as matters of fact, which are known only as probabilities to the asserter, and if men who have no scruples as to such a mode of dealing with their fellows are to be held as speaking "in perfect good faith," then who can possibly say what is truthfulness and what is not? And who then shall say what is virtue and what is vice? If any one shall say that it would not be truthfulness to tell that which one knows to be untrue, on whose authority shall he establish the distinction which makes it accord with perfect good faith to tell that as true which may be either true or false, for aught we know? Let it be carefully observed that this is not a matter of astronomy, nor of geology, nor of natural history, nor of theology, nor even of the highest

and rarest morality—but of the very simplest veracity. And yet it is inseparably bound up with the discussion of the relations of Bible history to the discoveries of modern science.

Those who think almost exclusively on the surface of things, and who eschew all that requires courage and care, such as are demanded in every case of important controversy, are ready to turn away from the arena on which we feel called on to strive for the truths now in hand ; but it would be a sad thing for society if all were equally indifferent to matters of such vital interest. The Bible, and the Bible as the voice of God, has been, and still is the corner-stone on which all that worthily distinguishes Britain among the nations stands securely. Amid all that we have reason to deplore, there is a world of good and right for which we can never be sufficiently thankful—good and right constituting the glory of our country ; but it would melt away like April snow if it were generally believed that this Book of God is of no higher authority than any other production of poor erring man. And to such a place of comparative insignificance must this Book descend if we are no longer to place confidence in the testimony which it bears. Few, if any of us have yet fully perceived the true gravity of such a consideration.



## CHAPTER III.

## THE NATURE OF OUR INQUIRY.

Our chief subject is the bygone life of the human family on the earth. Our main design is to give some account of the measure of knowledge as yet acquired by men in relation to this subject, and to show the bearing of that knowledge on certain momentous questions, especially on that which affects our faith in the divine origin of the sacred Scriptures. Our desire is to bring this knowledge, as it stands related to these questions, within the reach of ordinary minds. We have no doubt that it is quite possible to make even the geological aspect and bearings of this subject clear to the very humblest reader who is willing to understand them ; and we feel constrained to believe it of very great importance that this should be done. Interests of incalculable value are involved in the result of such an inquiry, for, as a very considerable portion of the public mind stands affected at present, the foundations of Christian faith are threatened as it were by sap and mine through the unsettling influence of that which is allowed to pass for science, while in reality it is only groundless and extravagant conjecture. We are encouraged to enter heartily into such an inquiry, for the state of things is favourable to investigation. The value of the interests involved tends

to give vigour and earnestness to an inquiring spirit, and requires of all of us to be patient and thoroughly charitable as well as honest in all our considerations.

Two great systems of thought in relation to the age and early history of man's life on the earth have been long in conflict, and are now contending with greatly improved weapons, and at somewhat close quarters. He who is under the full influence of the one system looks back into unbeginning ages and fancies that he sees men, women, and children peopling portions of this globe hundreds of thousands of years ago. He whose faith is founded on the other system looks back only about seven thousand years, and sees our two first parents in the garden of Eden commencing the earliest experiences of mankind. Those who take the first of these views not only imagine that they see back into an immense vista of bygone time, but that they also see man slowly becoming what he now is, from a commencement of existence in which he was one of the lower and even the lowest of living creatures. Those, again, who take the other view, believe that our first parents were created so far perfect as at once to be incalculably superior to the best of their degenerate descendants now. Before some minds these two systems of thought in regard to man's real history may be said only to float like dreams, or like those visions that rise to the soul when we are at a loss to tell whether we are asleep or awake. Neither the one view nor the other has, in such cases, been allowed, as yet, to take such hold as to become a real or effective belief. In the case of

others there has not been that progress in faith which leads to a confession with the lips ; but one of the systems to which we refer has clearly enough found a place in the mind, and is influencing the whole life of most valuable members of society. In a vast number of other cases there is both the belief and the confession of one or the other of these conflicting views. On one side, great and influential numbers unhesitatingly declare that the Mosaic account of man's creation, and the popular belief of his having lived on the earth during about seven thousand years only, are utterly to be disregarded. Great and influential numbers, on the other hand, adhere to the Bible view, and contend for it as the truth of the living God. We have thus two parties, composed of the most intelligent and earnest among men, who are expending all the resources at their command, each to uphold its own view as the true one, and both furnishing us with materials by means of which we may know and judge for ourselves. There are no doubt many excellent and Christian men who think that man's age, even to 500,000 years on earth, can be reconciled with the Bible history. Such men repudiate the inferences of those who bring geology to bear against Scripture, while they admit, and even contend for, the premises from which these inferences are derived. But the great mass of the young and ardent who are affected by the controversy are swept away before the tide of unbelief, which is the natural result of such reasoning as that with which we shall have chiefly to contend in considering the subject in hand.

It is not our desire to take up one of the sides of this great controversy, and to argue in its behalf as partizans ; but it is just as little our desire to write as if we could be neutral in heart while engaged in such an inquiry. There is beyond question a consideration involved, which cannot be ignored, and which cannot fail to quicken our watchful earnestness, though it need not mislead us in our investigations. It should not be for a moment forgotten that, as we have already said, the Bible itself, together with all that the divine veracity of the Bible sustains, is involved in this conflict. If it be really true that man was originally one of the inferior creatures, or that he is sprung by ordinary generation from "Simians" of bygone ages, as the first members of an improved breed spring from the inferior herd, and if it be also true that the first creatures capable of using tools as men, inhabited the earth hundreds of thousands of years ago, the history of mankind given in the sacred Scriptures cannot be true. It must not be allowed to rest on our minds for an hour, and to mislead us here that these tool-using beings, whose relics are now so precious to the geological antiquary, were less than human. We have now on the earth beings as truly human as the best of us, who are to this hour using the very same stone implements as were used by the inhabitants of Picardy, during the formation of the gravel beds, of which so much has been made of late years. Poor and degraded though these men and women are, no one can look on their faces without recognizing that they are brethren and sisters of mankind. If

the people of the earliest stone age did live hundreds of thousands of years ago, as certain geologists hold, the Bible history of man must be given up. This is a very serious consideration. It has nothing to do with the idea that the anti-Scriptural view which we have before us is "contrary to religion." The Bible is one thing and religion, as a popular or priestly "abstraction," quite another. Neither has this anything to do with the idea that the view we speak of is contrary to "the Church," or to the ideas generally of religious men. The Bible is totally distinct from all churches and from all religious men too. The Sacred Book may be where there is neither Church nor religion, and consequently where there are no religious men. The Bible has often stood and conquered when and where the Church, as thus understood, and all the so-called religious men of the time and of the place, were determined that it should perish; and it has sustained those in the hour of trial whom "philosophers" and "religious" men consumed at the stake. It is a grand failure in reasoning to confound the Bible with religion, as that is generally understood, or to imagine that it is identified with those who are regarded as religious men. If you take all the churches in the world, and all their members and creeds as well, and put the whole aside as fallible and even as false, but leave the Bible, it will probably prove for many minds a real blessing to be thus cast upon the simple Word; but if you lay the hand upon that Word itself, and pronounce its revelations false, the case is then serious beyond measure.

Let us not be misunderstood, however, in our use of this consideration. We do not mean that the fact of any notion appearing to us to contradict a Bible statement can of itself affect the truth or falsehood of that notion. We should deprecate the state of mind in which a man turns off disdainfully from a proposition on the mere ground that it is in his estimation contrary to the doctrines of the Bible. We mean in these pages to look honestly and most carefully into "the testimony of the rocks," and of all connected with these rocks. Most reverently would we listen to all such testimony, for we have no fears as to the issue, whatever that issue may be. But when the result of an inquiry must be either continued belief in the Sacred Record, or the abandonment of our faith in its truthfulness, it would be most culpable folly to forget the tremendous nature of that which is involved. It is the due consideration of this which is required to quench the spirit of reckless speculation so as to bring all engaged in the controversy to a really sober state of mind, and also to guard us against the heedless or credulous acceptance of that which is only too inconsiderately thrown out as the seed of future ruin upon the fertile soil of many a youthful mind.

An attempt is made to avoid the real seriousness of this issue by means of the idea that we may retain all valuable Bible truth, though we let the idea of the divine inspiration of the Bible go. To illustrate the futility of all such attempts, let us take ten men of various shades of opinion, such as we could easily find almost anywhere. Let it be understood that they have all Bibles,

and that they know their Bibles pretty fully. But they are to understand that they are to retain, of Scripture truth, only what each deems important, and to throw away the rest. How much of what the Bible teaches would remain when each had cut out the portion of which he disapproved? One scorns the idea of eternal punishment—another repudiates that of propitiation—another is as much opposed to “the new birth”—another can have nothing to do with miracles; and so on, till the whole that really makes up the grand revelation of God is dismissed. Then how, in the case supposed, can one blame another, or even correct him? The standard by which all were equally bound to square their ideas and their lives, so long as the Bible was regarded as divine, has been declared a standard no longer. Men who know even a little of human nature are aware of what this means, and it is not so wonderful if they should feel somewhat excited when influential members of society coolly tell them that their Bibles are obsolete, and contain a history of mankind which is utterly untrue.

Those who will have us to believe that the sacred Scriptures are not only defective, but positively misleading in many of the most solemn doctrines which the sacred writers teach, insist very strongly that, after all, these books make known invaluable truth to men. Some of these writers are even strong in their praises of the Bible; but it is of the Bible as their humble servant—not as their Master’s word. There lies the serious point of departure from the Christian position, which makes every truly honest man who

takes it confess himself to be no Christian in the proper sense of the term. You bring forward a Bible statement to such a man, and he meets you at once by the acknowledgement that he does not believe anything on Bible authority. You ask him on what authority then will he believe anything, and he replies, if frank and downright, that he is his own authority in all matters of belief whatever. He says that his mind repudiates many things which the Bible teaches, and that he is warranted in rejecting all such things because the Bible is no longer to be regarded as any more a standard of belief, than any other production of fallen man. In the same manner his mind repudiates much that even the best of his fellowmen believe, and he rejects that also, on the ground of man's well-known fallibility. His mind also repudiates many things that seem to be taught in Providence, if not in nature, and he rejects these also. They cannot be true, for they are repugnant to his understanding, and he must follow his own convictions! So he becomes his own master—virtually his own god. The result is not only terrible to himself when it is fully matured, but terrible to society so far as he receives power over his fellowmen.

We have said this much, however, only that the momentous character of our inquiry may be somewhat strongly before the reader's mind, and that we may go into it with a due sense of the responsibility of such a task. Our question must really be as to whether that view of man's life on earth which is given by Moses, or that which is now so energetically opposed to it, is really true.



We must look at every atom of real evidence on both sides. Our great anxiety will be to make the willing reader know all the truth on the subject which we may be enabled to bring under his eye.

## CHAPTER IV.

## PRINCIPLES OF INTERPRETATION.

WHEN we endeavour to uphold the truth of the early history of mankind, as that is given in the sacred Scriptures, on the ground of the divine inspiration of the Bible, we are met at the outset by the assertion that already all must admit the inconsistency of certain Bible statements with some of the established facts of science. It is argued that if we have given up one set of the statements made in the ancient Book, we may as well give up others which have been made on the same authority. The discoveries of the astronomer are relied upon chiefly in this mode of argument. It is strongly asserted that these are utterly inconsistent with Bible views of the creation and outfitting of this world as a habitation for man, and that the inconsistency is universally admitted among intelligent Christians. It is hence contended that since we have admitted the triumph of science over Moses in the matter of astronomy, we ought to admit the triumph of the same in that of geology also.

In looking into that which underlies this sort of reasoning, there are some things which it is of very great importance to keep in mind. One of these, as we have already hinted in a former chapter, is the distinction between what is called "the

Church" and the Bible. We are directed, for example, to the case of Galileo, and the solemn denial which he was compelled to give to the demonstrated truth of the earth's motion round the sun, as if the Roman priesthood had had Bible authority for the monstrous treatment which they gave to the views and person of that philosopher. Because the Romish priesthood's conduct in that affair is now universally condemned, we are, it seems, expected to admit an utter incongruity between the account of creation in the Scriptures and astronomical truth! Men at the present day ought surely to know better than to confound the words and deeds of the Inquisitors of that time with the Bible, which Inquisitors were just as little prepared to endorse as they were prepared to accept the statements of Galileo.

Another thing to be kept in view is the distinction between the actual statements of the sacred Scriptures, and the expositions given of them by erring men. Theories of interpretation are found to be of many kinds, and are very often of the most misleading character. From the ideas associated with the Mosaic record by the humblest mind that stands upon the "earth, and believes it to be a circular floor with the blue vault" as its actual canopy, up to the most ingenious inventions of the most fanciful of interpreters, there are hosts of fancies, and about as numerous hosts of fallacies, in the views taken of the words and works of the great Creator. Before the steady advance of true science one after another of these notions vanishes. That disappearance of human fancies, however, is one thing, and the giving way of any

Bible statement in its true meaning, is assuredly a thing very different. The true child of science, who will just as carefully examine the Book and its evidence as he examines the rock or the celestial orbs and their evidence, will never confound the conceptions of the comparatively uninformed popular mind with the unchanging testimony of the enduring record itself.

But there is a still more important consideration which comes in appropriately here. It is not only the uninformed among men who are subject to those forms of thought which are inconsistent with the revelations of exact science. Take for example a railway train, which is rushing westward at the rate of fifty miles an hour. How many in that train will for a moment imagine that they are being actually carried eastward, and not westward, at a rate as much greater than that which we have mentioned, as the speed of the earth round its axis is greater than the speed of the train? The intrusion of the scientific idea might for a little change the form of thought, as to the manner and direction in which they are being borne through space; but we may safely say that it would be for a very short time indeed that such a change would be matter of consciousness even in the most philosophic among the travellers. The same dominion of phenomena, or appearances, over all minds is abundantly manifest in all things of a similar nature.

We may take another familiar instance for the illustration of this truth. Up to this hour in the world's age, in all ordinary writing or speaking, we say that the sun rises in the east in the morn-

ning—continues ascending till he reaches the meridian at noon—and then goes down and sets beneath the western horizon in the evening. We write and speak of the moon and other planets after the same fashion. We should write so that no ordinary reader could know what we meant if we adopted any other mode of expressing our thoughts on such subjects. A very great many readers understand us as meaning literally what we say. They see the sun rise in the morning, or they see the moon rise in the evening—they see these orbs passing through the sky and going down—and they believe it all to be as their eyes tell them. We are compelled to speak of the azure canopy with its fleecy curtains, or its star-spangled glories, as the roof of nature above us, if we would speak of the sky so as to convey any idea of it to the ordinary mind, and the thought accepted is (in multitudes of cases) just the literal one which the words convey. The loftiest astronomer is just as much shut up to this mode of speech as is any one else. The advance of his enlightened mind over scientific fields does not relax the necessity laid upon him in this matter in the slightest degree. He speaks, and must speak to ordinary men, of the sun's rising, and of many similar appearances, in the same way as the most ignorant peasant must speak. But no one thinks of setting aside all he says of such things and in connection with them, on the ground that his words are utterly inconsistent with strict science. Men would be much more likely to set his sanity aside if he should seriously attempt to speak to an ordinary world in any other way.

Suppose, then, for the sake of further illustration, that we should have a controversy of this kind. One of the most graphic correspondents at the seat of war describes a battle. He begins with the words, "Just as the sun shot above the eastern wave, and had made his way some three breadths of his own glorious orb towards the upward sky, the bloody strife began." He pursues his history till he says of the blazing globe again, "He stood right over head and poured his hottest rays down on the anguished hosts as they writhed in mortal combat," and at last he tells of this same sun's "sinking beneath the western horizon, as if sick of the horrid sight presented by the gory field." All this is so directly in the teeth of what is understood by science that we can conceive of one of her frail votaries who should contend that the entire narrative was untrue on account of those utterly untruthful statements. And yet it is all perfectly true, as the writer intends it to be understood, and all ordinary men, women, and even children, understand it and believe it too. A foolish priesthood might foist on it a meaning it never conveyed—fanciful men might invent false theories by which to account for the use of such language in the recital of sober truth; and, after all, the language would be every way right and the truth also most admirably told. But neither could the language be justified nor could the truth be told or known by means of it, except on a certain understood principle of interpretation. The words of the narrator cannot be taken literally, nor according to their direct meaning. The fact that he is speaking

of apparent motions according to their appearances to the popular eye, and not of real motions according to exact science, must be allowed, or the ridiculous result to which we have referred will occur. Now this is a principle in the use of language, which demands a very wide divergence between statements considered in their literal meaning, and that true meaning which they are intended, and also perfectly fitted to convey. It involves also with the ordinary mind ideas that are very widely astray from the actually scientific truth. Yet he would be a very poor reasoner who would disallow the universally accepted principle of interpretation, by which we are led to regard the writer as telling us of things according to their appearance to the general eye and not according to their actual occurrence, as taught us by strict science.

It requires nothing further than the candid admission of this obvious law in the regulation of our use of speech, to remove effectually all idea of the inconsistency of astronomical discovery with Bible statements regarding the creation. Let any one suppose that God is about to give a man such an account of the preparation of the earth for a human habitation as shall be intelligible to the general mind, and that for this purpose the divine Teacher shall lead the prophet, in spirit, into such a position as will enable him to see and to hear that which he is to make known to the mass of his fellow-men. First of all he is made to look on the material universe rising into being by the power of the Eternal, and he beholds the glorious work, from the position assigned him,

coming up before him as "the heavens and the earth," and speaks of it as such. The most limited of human minds capable of understanding anything of the kind, at once forms an idea perfectly correct so far as it springs from the recounted visions of the seer, couched in his own simple words. The most advanced man of science too has the core of all the knowledge that has been, or (so far as yet appears) ever will be, acquired by him on the subject of creation expressed in that same unerring language. It is no fault of the vision, nor is it any defect in the language of Moses, if the ignorant reader or hearer should think that the earth is merely a plain, and the sky a blue vault over it, and that these are all the material universe. There is no ground for such an error in the vision, or in the language in which it is told, so far as we have gone at least.

In the result of creation presented to the inspired witness who is to tell truthfully what he sees, the earth rises to his view as a chaotic world, darkness covers its mysterious surface—and the breath of God moves upon its vast and gloomy waters. God is not teaching the observer astronomical or geological science. He is giving him such an idea of creation as will be intelligible to the mass of mankind, but the view given is in no way inconsistent with either astronomical or geological truth any more than are our ordinary ideas of sunrise and sunset. The astronomer and geologist are both alike ignorant of that appearance which the earth would have presented to a human eye on its surface at that stage of its history which is thus described; and we may



safely affirm that they have not the shadow of a reason to find fault with the description as a communication of the profoundest of truth to the common mind.

The next thing presented to the inspired observer is the breaking in of the light upon the chaos of our world. Enshrouded in the densest darkness he heard the voice of the Infinite saying, "Let there be light," and the light appeared. He tells exactly what he heard and saw. It is from no fault of his language, nor of his vision, if any one shall think or say that he teaches that there was no light in the universe till this time, or that sun and moon did not yet exist. Such an idea would be as inconsistent with Scripture in its views of the home of God and angels as it would be with astronomical science; but it could claim no countenance from the vision or language of Moses. If any one shall imagine from it that there was light on earth before the sun shone, or even existed in the universe, he is answerable for his notion, but the sacred record has nothing to do with his dream. The seer is then shown the light divided from the darkness so that, as the matter appears to him, evening and the morning constitute the first terrestrial day. Again we remark that he is not taught astronomically—he is shown the occurrences as they would have appeared to any one occupying his position and enjoying such a vision. He truthfully tells what he saw. All that he says is in as perfect accordance with astronomical truth as is our speaking of the rising sun or the waning moon. He is describing the scene as it would have presented itself to an

ordinary observer, and not the movements by which that scene was produced. We have only to keep this in mind in order to be perfectly satisfied with his description as that which unerring wisdom enabled him to give.

We beg the reader to notice how very different the relation of science is to descriptions, such as those we have been considering, from that relation which is borne by the account given us in Scripture of the age of man and the character of his creation as a perfect human being, to the speculations of those who insist that he has inhabited the earth for hundreds of thousands of years, and that he sprang from the lower creatures by ordinary generation. It is one of the grandest of mistakes to confound things that so essentially differ, and to argue that because we admit that the description of the creation is popular and not scientific, we must also admit that the historical statements of the Bible may be set aside as even the reverse of true.

## CHAPTER V.

## THE VISION OF CREATION.

IN speaking of that idea of the revelation given to Moses, which regards it as a vision of creation adapted to the ordinary mind, Mr Goodwin says : —“ We are asked to believe that a vision of creation was presented to him by divine power, for the purpose of enabling him to inform the world of what he had seen, which vision inevitably led him to give a description which has misled the world for centuries, and in which the truth can now only with difficulty be recognised.”\* This is a bold charge of deception brought against the author of the Book of Genesis. Possibly Mr Goodwin does not mean intentional deception, but certainly he does mean a charge of stating as facts that which was unknown as such to the writer of the Mosaic narrative. Our first duty, in view of such a statement, is to inquire whether it itself is founded in fact. Is this charge of misleading the world true or false? The description of Moses has led many in the world to believe that “in the beginning God created the heavens and the earth.” Have they been misled in this belief? His description has led the world to believe that this earth was not introduced into the universe clad and peopled as it is now, but that at the time

\* *Essays and Reviews*, page 207, small edition.

when it began to be fitted up for living beings, it was in a state of chaos. Have men been misled in believing this? His description has taught men to believe that a process of preparation going on from one vast act of creative power to another, completed the abode which man was to fill—made it the abode successively of multitudes of inferior creatures—and that man was then placed in his well-furnished habitation. Have they been misled in all this? Does not geology, in so far as it teaches anything satisfactorily, teach us these very things as the grand first principles of the earth's history? Assuredly it does. Mr Goodwin blames the Bible for the popular idea that the earth is at rest in the centre of the universe, and that the sun, moon, and stars are small lights shining out of what he calls a "watery vault," and nothing more; but is the description of Moses really accountable for those notions which are the inevitable result of uninformed sense, not yet corrected by science. That result is the same wherever man is found. Is Moses responsible for that which is as certainly man's idea of the universe where the Bible has never come as it is where that sacred book is most fully known? The truth is, that the account which the inspired observer gives in Genesis has led, and never misled, the world on this most momentous subject. The charge, therefore, is utterly unfounded. It is palpably false. No one could make such a charge while having due regard to the actual state of the case of which he is speaking.

Let us illustrate this truth in following out the vision of creative work given in the first chapters

of the Bible. We have already gone over the view presented to the spiritual eye of the seer on "the first day." He has seen "the heavens and the earth" rise into being. He has stood amid the dismal sight of a chaotic world, and has seen the light fall upon it. The night has fled and the day has passed before his enraptured mind. During what appears to him as a "day" he has heard the word of the Almighty One, and seen these grand effects of his power. Another night passes, and now there is shown him the formation of a strange "expanse" between the waters that spring from "the fountains of the great deep," and those other waters that are poured out from "the windows of heaven." Is there no truth worthy of science taught here? Does not science of the purest kind teach us of an expanse which separates the waters that float above us from those waters that roll beneath us? Is it possible to put the scientific idea of the atmosphere before the popular mind in any more truthful form? This firmament is called "heaven" as men speak of "the fowls of heaven," and of "the four winds of heaven," or of anything else that belongs to the air which is meant, and understood to be meant, by all ordinary minds. It is as far from truth as anything can well be to say that astronomical science, or any other science, has altered the truth thus taught. Those writers who are so resolute against the truthfulness of Scripture in this respect often refer to the ideas taught "in schoolbooks," that these great changes took place during two natural days of twenty-four hours each. Whatever may be thought of this "school-

book" idea, and however the question of days may be settled, it will be admitted by the true philosopher that, *so far*, science, considered as irresponsible for all conjecture, teaches us nothing to contradict the doctrine that the grand events of creation occurred as Moses has very strikingly represented them. Even the question of hours will not be hastily spoken of, as if geology had yet decided it. But more of this hereafter. What this Bible account does teach us of the breaking in of light and the formation of the expanse with the waters above it and the waters below it, is strictly and perfectly true. No man, whether scientifically cultivated or without such culture, will deny this, if he is really prepared to look at the subject as it stands.

The next great step in the divine work which was presented to the mind of the seer was the separation of sea and land, by the raising of the surface of the solid earth above the surface of the waters. He heard the command of Jehovah, and he saw the dry land rise from the ocean. Is it possible for any one seriously to contend that no scientific truth is taught in the statement of this feature in the world's preparation for its inhabitants? If geology teaches us anything it assuredly teaches us of the formation of dry land by its upheaval from the bosom of the deep. In doing so it only confirms this vision of Moses. As clearly as it will ever be in the power of the most accomplished geologist to teach us anything, this ancient record lays before the very humblest reader the grand features of the great process by which this globe was built up for a home of the

living myriads by whom it has since been peopled. Sir Charles Lyell, like all true geologists, has ever and again to combat the popular notion that the sea sinks down and leaves the coast dry. We have often marvelled at the tenacity with which people living on coasts, that have risen above the sea level, hold to the idea that it is not the land that has risen but the sea that has gone away to some other shore, or sunk into the earth. It is no small testimony to the Bible that the scientific view is there given, and not the mistaken popular one. It is really too bad to find men pluming themselves on their superior intelligence and culture, and boasting of their "advanced views," still so ignorant or so obtuse as to speak in sneers of this unerring revelation, when true science with her cautious, patient, reverent steps is only corroborating, in all its grand elements of truthful witness, the testimony of the inspired narrative.

But the vision of this "third day" embraced the clothing of the upheaved land with vegetation, as food for the creatures that were afterwards to dwell upon it. The darkness that fell upon the scene of divided waters, shrouding those beneath and those above also, fled at the approach of another dawn, and the prophet saw the dry land rise, and beheld it covered with verdure and fruitfulness ere the light again withdrew. If we do not find fault with the *mere form* in which the grand truth is taught, it is not possible to find scientific fault with that truth itself as here presented to us. We cannot, surely, have been misled in believing that the earth was made to bring forth as we are here taught regarding it. We

should like to see the man who would put the same amount of truth into as few words, and at the same time convey as much of real knowledge as these inspired sentences convey to the popular mind. Science fails to reveal to us how any original seed of herbs found its way into being, but it does most assuredly teach us, as its very first lesson on the subject, that vegetation sprang from this fruitful earth as soon as land had become capable of sustaining it, and this is just what the mind of Moses saw and recorded for mankind.

The fourth grand scene in this vision of revelation presents to the seer the appearance, in the expanse above, of the sun, moon, and stars. He heard the command of the Infinite One that these luminaries should exist, and that their use in the heavens, so far as earth is concerned, should be, while they lighted up this lower world, to divide days from nights, seasons from seasons, and, in the matter of time, days from years. He saw the two great lights appear in the sky, and he heard the uses assigned to them, and to inferior stars also, and he simply describes what he heard and saw. We purposely leave over for the present, the question as to the "evening and the morning," and the nature of the "day" of which he speaks, and looking from the position of one who has such a vision as this presented to him, we feel constrained to ask how he could have described what actually occurred in a better way? It is certainly true that God made the sun, and moon, and all the stars. It is as sure that he made them to be the means of lighting up this earth and dividing its days and nights, and also



its seasons and periods of time. It cannot be doubted that one to whose mind this great truth should be presented in epitome, and as a vision, would see and hear just what this prophet describes. It is impossible that the most scientific of men could place the matter more truthfully before the ordinary mind so as to give the people the knowledge conveyed more fully in the same narrow compass of words. If any one thinks that he could excel the ancient writer in this matter, let him try. We should be most anxious to see the result of his effort. Those who have given most attention to what is known as the speculations of the scientific world, will be most fully aware of the truly impossible nature of the task of forming one clear idea from their ever-changing conjectures as to the real history of creation. It may be fairly questioned whether those ideas which geologists have formed as to the progress of creation work are not as much the result of their early education, derived from the Bible, as of the natural science which they have cultivated. Men are led far more powerfully by preconceived ideas than they are conscious of being so led. They reach conclusions by the light of thought already in their minds much more speedily than they would if left to the effect of that which they slowly gather in the field of physical inquiries. If we are not greatly mistaken, geology is vastly indebted, in this respect, to the Mosaic narrative. Moses is little more than corroborated as yet by all that has turned up in the progress of geological research. The true effect of enlarged scientific knowledge is to enable him who possesses it to

form an enlarged conception of the truth which the Hebrew lawgiver has presented, but assuredly not to remove one particle of that truth from the mind.

The fifth grand section of this vision of creation, presented to the inspired observer, shows him the peopling of sea and sky with their appropriate inhabitants, while the sixth shows him the peopling of the dry land, crowned at last by the creation of man. In the seventh grand scene the rest provided by the divine Father for the toiling millions is inimitably portrayed. After these "generations of the heavens and the earth" are placed before our minds, we have the briefest view of God's own culture ere yet there was a man to till the ground. We are told that he created every plant of the field before it was in the earth, every herb of the field before it grew, and that ere the rain had yet fallen he caused the mist to ascend that he might water the whole face of the ground. All this is surely in perfect accordance with the best of science. Must it not have been just as Moses tells us? But God made man from this very ground, and breathed into his nostrils the breath of life that he might be a living and intelligent cultivator of the soil. Then follows the divine preparations for carrying out the kind design with which man, as a creature of this earth, had been formed. Here we again remark that if we are reasonable and intelligent enough to distinguish between the outward form in which truth is communicated to man, and that truth itself, we can scarcely conceive that any one can imagine how advancing science can be said to call for the altering of one iota in this revelation.

We come now to the point involved in the seven days, or, as they are generally taken, the six days on which the seer beheld creation's work done. Here everything, we think, must turn on the use made of these days in the vision. So far as we can see, the true science of interpretation shuts us up to regard them as days of ordinary length—that is, from sunset to sunset in an ordinary day. But this makes it all the more easy to settle the question as to the use made of them by Moses. Were they used to measure creation work in its various stages? Were they meant to teach us the exact time in which creation work was begun and finished? or were they used merely to measure the vision of that work presented to the inspired mind? In other words, do these days affect the essence of the truth which is taught us, or do they affect only the form, or dress, in which that truth is made known? It has been under the influence of the belief that they affect the essence and not merely the form of the truth that master minds have been led to spend so much labour in endeavouring to settle the question whether they are to be understood as natural days of twenty-four hours each, or vast periods of time. Taking it for granted that these days are mentioned as measuring the actual eras during which the successive stages of creation work were gone through, these great thinkers have strained their utmost powers to reconcile such a use of them with known truth. We must confess that we have not been able to hold to either one or other of the explanations given of these “evenings and mornings,” or “days,” on this assumption that they

describe the several periods of creative work. It is quite true that the best informed are yet in profound ignorance of vast regions of geological evidence, and that nothing is more truly unsettled than are most of what are called "the principles" of the science; but enough seems to us to be known to preclude us from believing that the six days of Moses, considered either as six days of twenty-four hours, or six vast epochs, can be regarded as correctly measuring the stages of creation even in relation to this world.

It seems to us beyond doubt, as we have already said, that Moses looked upon the seven days of which he writes as seven ordinary days. He not only says that "God blessed the seventh day and sanctified it; because that in it he had rested from all his work;" but, when giving the commandment of the Sabbath, he says, "For in six days the Lord made heaven and earth, the sea and all that in them is, and rested the seventh day; wherefore the Lord blessed the Sabbath day and hallowed it." (Ex. xx. 11.) Here we cannot see how any one can doubt that the Sabbath day on which, as one in every seven, men were to rest, was just an ordinary day, and that the six on which men were to work were also ordinary days, in the writer's mind. As he had seen creation, six of these ordinary days sufficed for the whole work. If we must necessarily believe that his narrative is intended to describe, not merely what he saw and heard in the vision of creation presented to him, but what actually took place in the construction of the material universe, along with the exact time in which it was all

accomplished, we feel that we should be compelled to look upon the changes which occurred from chaos to paradise as all accomplished in the short space of six ordinary days. This, it must be observed, introduces the question as to whether Moses was taught not only the general nature of the work of creation, but the *time* during which it was effected. Some have thought that he was taught not only the character of the work, but also the time during which it was done, and that that time was just six ordinary days. There appears to us an insuperable difficulty in the way of such a view of the subject; and the same difficulty must, we think, appear to every one who has really pondered the indisputable discoveries of science.

But we cannot regard ourselves as shut up to look upon these days in this one aspect. They may affect the form, or characterise the scene by means of which the truth was communicated to the seer's mind, without affecting anything essentially belonging to the truth itself. They seem, indeed, essential to the form in which it appeared best to the great Instructor to communicate the knowledge of creation, and to at least one grand intention which he had in view in giving the revelation that form. He adopted the panoramic plan, and intended to establish the seventh day rest by means of that seven-day form which he gave to the vision of creation. In the execution of the plan with that intention we cannot conceive of his adopting a better form than that which presented to the eye creation work in six sections, each seen in its accomplishment during the course of one

ordinary day, while Jehovah's rest was seen on the seventh. The fact of creation, and the gradations of creation work, were all beautifully revealed, yet in such a way as to fasten on the general mind, by God's own example, the momentous institution of the regular rest day. Even the idea of successive portions of time was truly communicated, only through the contracted figure of six ordinary days, and so as to stamp with a peculiar impress of sacredness the hallowed seventh. The greatest difficulty in the case is the inconsistency of the six days' time with the actual duration in which the changes preparatory to man's creation took place on the earth, as that duration seems unquestionably taught by the rocky records which are now read by geology. The time presented to the mind of Moses was six days—the duration actually occupied was a series of vast epochs. Is not this inconsistency, however, merely the difference between a large life size portrait and a miniature? The difference is only in size of view. Moses sees the miniature—science dimly sees the larger picture. That is all. The miniature most correctly gives the features of that of which it is the representation—only in miniature. There is not one feature really changed in the most comprehensive conception of the vast work yet embraced by the mind of man. Is this a case warranting the charge of misleading the minds of men for centuries? We cannot so regard it. We are told, indeed, by the opponents of the Bible, that this ancient cosmogonist was writing of what he knew as probabilities only, although stating them as facts; but we must beg

to be excused from bowing to the authority on which such a very serious statement is made. In whatever way the account of creation was presented to the seer's mind, it most unquestionably appeared to him as he relates it. So far as his view of the subject is concerned, we cannot imagine him as seeing or hearing otherwise than just as he speaks. The darkness of the night and the light of the day—the two together forming the one diurnal period—passed before him these seven times. They seem to us simply to have marked seven divisions of that panorama which he witnessed in spirit, and which he so wonderfully portrays. Thus understood, the days determine the character of the vision as a vision, and so far they affect the form of the popular thought in which the truth is conceived, but they do not in any degree vitiate the essential truth which underlies and gives real substance to that thought. Speaking with the most scrupulous exactness, they affect nothing but the space of time at first thought of as actually occupied in creation work. Instead of giving to the learner the incomprehensible and bewildering idea of vast immeasurable durations, inconceivable to the ordinary, or even, perhaps, to the human mind, the seer is guided to present the grand elements of the truth as to the world's commencement in such a form as will teach mankind the greatest possible degree of knowledge on the subject. If, then, we shall believe that Moses had seven successive days—ordinary days—presented to his mind—that in the framework of each of six he had the picture of a department of creation work set before him,

and in the seventh a picture of Jehovah's rest—every part of the panorama teaching correctly the true nature of one department or stage of progress in creation, and the whole account teaching, most fully, to the popular mind, the grand sum of Jehovah's work, if progressive science should affect that which is but the form of thought, which we derive from such a view, while it leaves the essential knowledge which it gives still the same—shall we not be able to distinguish between this and the totally different result of science contradicting and reducing to palpable falsehood the essential elements of the revelation? We cannot but think that a writer desirous of making the best of the Bible that truth would allow him to make, or one free from the desire to break down all confidence in its divine authority, would find it very difficult indeed to miss the grand reality of the revelation given through Moses on this great matter so as to be engrossed with the mere changing forms in which that revelation was communicated. The writer of the Epistle to the Hebrews gives us a very good instance of how he took the essence of truth from the sacred record. He says (chap. xi. 3)—“Through faith we understand that the worlds were framed by the word of God, so that things which are seen were not made of things which do appear.” This and much more of eternal truth is easily understood from the Mosaic revelation, even though the form of the vision should be affected to the last degree to which it is possible for progressive science to carry us beyond it. In the light of expanding knowledge we find our view of the great subject widening in all its



parts, and, so far as widening goes, we are glad of the effect. When a day expands into a vast series of ages we feel that no harm has come, any more than when our childish ideas, so contracted, grow into those of manhood. When forms that were narrow enough to be easily comprehended by the most youthful mind grow into the broad, and long, and deep views of maturer knowledge by means of scientific culture, while still the same grand old reality keeps all its integrity and truthfulness, we feel only the more thankful. When, however, the rude hand of the destroyer is laid on matters which are not things of form, but essential elements of divinely-given knowledge, the case is totally changed.

## CHAPTER VI.

## OUR CHIEF SUBJECT.

WE have thought it well, before entering on the direct consideration of the Age of Man on earth to glance at those minor subjects that are more or less intimately connected with the controversy which has been raised on that most important affair of Bible history. That portion of the public mind which is represented by the "Essays and Reviews" is all but identical with that which is affected by the popular work of Sir Charles Lyell on man's antiquity. His volume, indeed, seems to mark the culminating point of the movement, which showed itself strongly, when the "Essays and Reviews" were published in a separate volume. Some idea of the drift of the essayists and reviewers seems necessary to a right understanding of Sir Charles's true position. But their efforts are feeble in the extreme when compared with his; and hence we are called to give the full measure of our best investigations to the subject of man's age as a race, rather than to any other phase of the controversy so unhappily raised between Scripture and science. To this, therefore, we now desire the undivided attention of the careful reader.

As might be expected, the account of the creation of our first parents, and that of God's treatment of them in early innocence and also in guilt,

are much more full than those of the material and merely animal world. Then the following down of the history after the fall is still more clearly matter of evident and honest narrative. Moreover, the truthfulness of the whole of the Old Testament, and also of the New Testament revelation, is so involved in that of this early account of our race, that we seem shut up to regard it as a truthful history, or to surrender all faith in the Bible and in all who were involved in its construction. Minds at once logical and honest, having no possible interest in that which they believe and maintain, except such as all must have in the truth, are not prepared to accept of a medley of truth and error, such as some are anxious to make the Bible appear, and such as it would be if its plainest history is utterly untrue.

The length of time during which human beings have been on the earth, measured to a day, is not a matter of practical importance in our present inquiry. The mere question of exact duration is not one which, taken by itself, could warrant any very earnest investigation. And yet we have a revelation of something like the fact that man has not been in this world much, if any, above 7000 years. By taking advantage of the sources of information within reach of patient research and moderate learning the conclusion is gained with no small certainty that the Bible, as originally penned, teaches us to regard the whole duration of the human family as yet confined within something like that number of annual periods. The very generally received idea of the age of our race in this world is derived from the data furnished in

the Hebrew Scriptures, provided with what are known as the "Masoratic points." These points modify the meaning of many passages and seriously affect ideas of time given us by the Bible. Guided by these we lessen the age of man on earth by about a thousand years, but guided by the ancient Greek translations made from the Hebrew before these points were added we are taught to give at least 7000 years, as we have stated, to the existence of the human race since its creation. This we unhesitatingly prefer as, to our minds, evidently the truth. This Bible view of the time of man on earth is intimately, perhaps inseparably, wrapped up with the idea of his being created pure and noble in his nature, and so as to be at once introduced into the most intimate fellowship with God. The Bible account is incapable of being reduced to consistency with the idea of mankind having been originally on an equality with the lower animals, and becoming gradually or suddenly improved into our present nature. If the Sacred Record teaches anything at all it teaches us that man did not rise from the position of the savage in the first instance, but fell and descended so as to reach that sad condition from the position of a child and friend of Jehovah. We are perfectly aware of the tendency to which our minds are exposed in reading the Bible account of man in Paradise—a tendency which leads us to form ideas of his original development that have no foundation in the Sacred Record ; but with all due regard to the necessity of avoiding that source of exaggeration, we cannot well conceive of any one imagining that the inspired writer meant to

teach us that our progenitors were less than pure, sinless beings, created and placed in circumstances of the greatest happiness of which their nature was then capable. Although in their nakedness, and helpless situation when driven from their first abode, we might recognise something like the savage state, the history which follows, especially when we have Cain and Abel coming with their offerings to God, together with the whole current of idea which flows on in Bible history regarding mankind, precludes our coming to the belief that originally human beings were such as the present conjectures of some eminent geologists would lead us to imagine. If we accept these conjectures we must give up not only the Book of Genesis as a truthful history, but all the Scriptures, and also all the teachers whose knowledge and veracity are involved in the Bible. What, for example, are we to make of Paul with all his use of Adam's history, or of Paul's divine Master, with his confirmations of Moses, if we must admit that all this ancient narrative is fiction?

Sir Charles Lyell puts forward his ideas of "the theory of progression" with great caution; but he leaves us in no doubt as to the nature of that view of the origin of our race which has taken hold of his mind, and which finds in many others less hesitating expounders. Speaking of the steps of elevation occurring in the birth of remarkable men, in one of his most important sentences he says:—"If, in conformity with the theory of progression, we believe mankind to have risen slowly from a rude and humble starting point, such leaps may have successively intro-

duced not only higher and higher forms and grades of intellect, but, at a much remoter period, may have cleared, at one bound, the space which separated the highest stage of the unprogressive intelligence of the inferior animals from the first and lowest form of improvable reason in man." As we shall see in pursuing his course of argument, the whole of Sir Charles's statements of fact, and of inference from fact, tend to the conclusion thus hypothetically presented. The progress of geological discovery not only so far as that has gone, but also as it is anticipated by scientific minds pursuing this track of thought, is all so contemplated as to induce the belief that the most ancient relics of humanity will be found to be those of brutes in reality, and certainly not (as the Bible teaches us regarding our progenitors) those of intelligent and noble men. Vast ages are imagined to be necessary for that development of our race from so inferior an origin as is thus conjectured. Difficulties regarding it are got over by the assumption, or proof, of hundreds of thousands of years having fled since human beings were first on the earth, and hence the astonishing efforts made to build up a superstructure of mingled fact and fancy issuing in the idea of so great an antiquity of man. It will be at once seen that this is really a following out of the train of reasoning which aims at the destruction of our faith in the earliest narrative of the Bible. It upsets all ideas that can be gathered from the Scriptural history of the early nature and government of our race, together with all the doctrines founded on that history.

But the conclusions to which the scientific world seem tending on this subject may be put to the test of sound reasoning. So far as statements are really expressive of matters of fact they may be accepted fearlessly. So far as arguments are valid deductions from fact, they may be admitted in all their force. But so far as the facts are coloured the colour may be taken off, while so far as the arguments are void of logical cohesion they may be set aside.

## CHAPTER VII.

## THE ARGUMENT FROM THE GROWTH OF PEAT.

THE scientific inquiry as to the duration throughout which man has been an inhabitant of this world begins naturally with the present, and goes back into the records of bygone ages. When we pursue the track in which geology leads us, beginning with those portions of the earth's surface which have been formed, or are now in course of formation, as the most recent of a great series, we proceed step by step till we have reached the oldest in which any traces of human beings, or of their works, have been found. The first strata that claim our serious attention in this process are the accumulations of peat which cover no inconsiderable portion of the dry land, and extend even to considerable distances and depths under the ocean. As these have been found to contain multitudes of the relics of man, the question as to the length of time during which they have been in course of formation becomes one of very considerable interest, and is treated by all candid investigators accordingly.

To give the reader an intelligent view of the argument which springs from the peat it is necessary to explain its formation. There is a large class of plants whose roots are naturally converted into carbon as the plants themselves grow on the



surface of land or water. If you take up one of these plants, with a good long portion of its root, you find that the lower part of that root has become black, or, in other words, has been carbonized. It is this black substance, or carbon, which forms the special ingredient in all real peat. When this has been formed by the natural growth of the peat-producing plants it has the effect of carbonizing, to a great extent, all vegetable substances around which it gathers. Even "the heart of oak" that has got imbedded in it becomes black as coal, and is preserved as a substance which is almost entirely composed of carbon. There is thus a double increase secured for the mass which is all regarded as a growing peat. So long as the peat-producing plants are growing on the surface, these are adding their carbonized roots to the bulk beneath, and so long as their stems and other portions, together with all additional vegetable matter that may mingle with these, are falling, or floating into the bog, so long the peaty accumulation increases in volume.

It will be carefully observed here, that the *peat itself* (when once fairly formed by the carbonizing of its living producers) *does not grow*. It no more does so than the kindred substance of coal grows in the mine, or the bed into which the mine is driven. If the plants on its surface are removed, or killed, in any way, and no further supplies of vegetable matter are introduced, the peat must remain as it is without further increase. It is consequently untrue, in strict language, that "peat grows," though it is true that it is increased, as it is produced, by the growth of vege-

tation on its surface. Failing to observe this very obvious truth has, as we shall see, led Sir Charles Lyell, and his French friend, M. B. de Perthes, into a very ludicrous mistake.

When the black or carbonaceous matter, which is properly called peat, has been formed, it mixes easily with water, making that yellow, or brown, or black, or miry, so as to cause the mixture to be like thick tar in appearance. In a part of Renfrewshire, what the country people call "*grule peats*" are formed out of this mixture by being simply lifted in portions between the two hands and laid in order on the turf to be baked by the heat of the sun. In this state peat mosses, like other liquids, or semi-liquids, "seek their levels," and flow from higher on to lower beds, as the formation of the surface allows. Hence a deep hollow is filled, not only by the growth of the peat-producing plants on the surface of the water, or marsh immediately above, but from the flow of peat from higher to lower ground. This causes the surface of vast regions of peat to be quite flat, while the bottoms on which they lie are very far from being so. It causes also the thicknesses of the same mass of peat to be often extremely unequal. It accounts too for beds of peat passing down the sloping beach and getting beneath the sea, where no peat-producing vegetation ever grows.

It seems nearly incredible that a man of Sir Charles Lyell's scientific standing should allow himself to reason as if he were profoundly ignorant of all these obvious conditions of peat formation. For example, when speaking of an accumulation

of peat, of which he makes a very great deal, he says :—"The workmen who cut peat, or dredge it up from the bottom of swamps and ponds, declare that in the course of their lives none of the hollows which they have formed, or caused by extracting peat, have ever been refilled, even to a small extent. They deny, therefore, that the peat grows. This, as M. Boucher de Perthes observes, is a mistake, but it implies that the increase in one generation is not very appreciable by the unscientific."\* Only let us note this as a specimen of the "advanced knowledge" and mode of reasoning by which the Bible is to be removed from the belief and confidence of man. In the hollows, to which reference is made, the vegetation, by the growth of which the peat naturally increases, has been entirely taken away. No fresh matter of any kind has been introduced. The peat, as it now stands round those hollows, is not sufficiently liquid to flow into the openings made for it. How, then, can the peat "*grow*" either in one generation or in a thousand? And yet Sir Charles solemnly remarks, that this shows "that the increase in one generation is not very appreciable by the unscientific!" The workmen were right. And they properly used the language, peat does not grow. The "unscientific" happened, in this case, to have retained their common sense, but the "scientific" were wrong—the "educated" had allowed their wits to go wool-gathering! And yet these are the gentlemen we are invited to follow when we leave the Bible, in order to enjoy the privilege of "advanced religious views!"

\* *Antiquity of Man*, p. 110.

But we must look to other samples of melancholy carelessness in reasoning on such a momentous subject as this of the age of man, involving as it does the very foundations of Christian faith. Speaking of this accumulation of peat in the valley of the Somme, Sir Charles says that it is "twenty to thirty feet thick;" again, that it "is from ten to thirty feet in thickness."\* Then he says, it is "in some places thirty feet thick, and is even occasionally more than thirty feet." But this is not all. He says—"The peat extends to the coast, and is there seen passing under the sand-dunes and below the sea-level. At the mouth of the river Conche, which joins the sea near the embouchure of the Somme, yew trees, firs, oaks, and hazels have been dug out of the peat, which is there worked for fuel, and is about three feet thick." Here, then, we have the fact that this body of peat is (not from twenty, nor from ten, but) from *three* to somewhat over thirty feet in thickness—that is, the hollows into which it has flowed are in some cases somewhat over thirty feet deep, but the portions that have depended for their thickness or growth, and may have been lessened by the liquid or semi-liquid flow from them, are in one place at least only three feet through, as they stand now. Any one who observes carefully the nature of the argument will see the great importance of this error. Let us suppose that a bed of peat is at one place in a valley thirty feet thick, and at another place in a connected valley only three feet, but we argue as if it were all over thirty feet in its thickness,

\* Antiquity of Man, pp. 107, 108.

the conclusions to which we come from such a misconception must be wide indeed of the truth. The deep places filled to the extent of thirty feet may have been first occupied with fallen and drifted timber or brushwood, and that converted very speedily into peat. The true growth may be seen in the three feet portions only. Yet we shall see how Sir Charles overlooks all this, and argues as if no such disparity of depth were in the case.

But he also reasons as if there were no fresh water in the valley, and as if the whole field of peat were above thirty feet in thickness. He says, in proof, that the land level has been changed. "If thirty feet of peat were now removed, the sea would flow up and fill the valley for miles above Abbeyville." This is clearly a double error. If the valley of the Somme were not only cleared of peat, but of everything else to the depth of thirty feet, the sea would still have the waters of the descending river to contend with. In times of floods, at least, this would fill the valley as effectually as the peat, and not only keep out the sea, but drive its briny waters far off from the shore. Even if the river got low it would still be sufficient to supply an effectual barrier to keep the really salt water near the inlet and out of the upper parts of the estuary. Sir Charles's mind is full of "alternations of level" and "vast periods" during which these have taken place, as he fancies, and so he loses sight of the most palpable facts of the case before him. This is evident, even if we think of nothing but the fact that fresh water flows down the valley in question, and must occupy space as really as peat or any other substance in

nature. But he tells us, as we have seen, that at the point where the fresh water and the sea now meet the peat is only three feet thick, and not thirty. If the whole of the peat that is there in existence were removed the sea would only have three feet less of a barrier between it and the valley, and we may safely believe that it would stay at its present shore !

In another important point yet to be noticed, Sir Charles reasons on this "thirty feet" assumption. We cannot but appeal to every reader who is prepared to give serious thought to such a subject as this, and ask if it is not beyond measure unworthy of so momentous an issue as that which is here involved, for a man to reason with such utter disregard to all correctness ?

This spirit of carelessness follows Sir Charles even in the reading of the proofs of his volume. For example, he says, regarding the peat formation at Abbeville—"This vegetable matter is all of submarine"—(yes "submarine")—"or fresh water origin."\* He must have meant to say that *none of it* is of "submarine origin." He says, "It must have grown above the sea level when the land was more elevated than now." And yet "this vegetable matter is all of submarine or fresh water origin." We are perfectly well aware of the difficulty of keeping the printer right, and this blunder is, no doubt, the result of a mere slip of the pen or of the press ; but it is in thorough keeping with everything else in the book, as we see by the apparently unconscious use of "thirty feet" instead of "three" in reasoning about the relative

\* Antiquity of Man, p. 111.

level of land and ocean. The man who notices no difference between the use to be made of three feet and that to be made of thirty, in such an argument as this, is acting out his carelessness when he says "all is of submarine origin," instead of saying, as he must have intended to say, "none is of submarine origin."

The true measure of the peat in the valley of the Somme would be found only by means of the proper average thickness arrived at when all the shallows and depths of it had been measured and the mean thickness really calculated. We venture to assume that, in such a case, it would be found much nearer to the three feet than to the thirty. Then it must be carefully kept in view that the average depth would be no fair measure of the time during which it had been in course of production. As we have already hinted, its deepest portions might be greatly composed of the *debris* of forests, brought down into the lower parts of the valley, and converted speedily into peat. The thinner parts alone could thus give any indications of age.

The importance of all these remarks will be seen when we take up the vital part of this argument from the growth of peat as that is found in the scale of measurement adopted by M. B. de Perthes. Sir Charles Lyell tells us that "the peat is often so fluid that heavy substances may sink through it, carried down by their own gravity. In one case, however, M. Boucher de Perthes observed several large flat dishes of Roman pottery lying in a horizontal position in the peat, the shape of which must have prevented them from

sinking or penetrating through the underlying peat." On the slender foundation that these flat dishes could not sink in semi-liquid peat, which rises over the edges of flat objects, even if many yards in diameter, this Frenchman, "allowing fourteen hundred years for the growth of super-incumbent matter," "calculated that the thickness gained in a hundred years would be no more than three French centimetres," that is about an inch and a fifth! This frightens even Sir Charles, and he gravely says—"We must hesitate before adopting it as a chronometrical scale." And then he says as gravely—"Yet by multiplying observations of this kind, and bringing one to bear upon and check another, we may eventually succeed in obtaining data for estimating the age of the peaty deposit." We really wonder if Sir Charles believes (that is, after giving the matter five minutes' thought) that any amount of the most childish blunderings, such as this calculation obviously is, can issue in a scientific result, such as that which he complacently hopes for in this way. No wonder if the man who could imagine that the thoroughly carbonized matter at the bottom of moss holes really *grows*, only so imperceptibly that a generation could not observe its increase, should be able to go through any other flight of creative fancy; but how men can possibly reason, and publish their reasonings to the world, with such utter lack of serious care, when the highest interests are involved, it is difficult indeed to divine.

Sir Charles Lyell himself, in his "Principles of Geology," gives an instance of the growth of



peat, which it is remarkable he should not quote alongside of this folly of M. B. de Perthes. He there says—"We also learn that the overthrow of a forest about the middle of the seventeenth century gave rise to a peat moss in Lochbroom in Ross-shire, where, in less than half a century after the fall of the trees, the inhabitants dug peat." On the Frenchman's scale their peats would be about half-an-inch thick!—that is, half-an-inch and half-a-fifth!—and such a stratum of carbon would be a "peat moss"!! In the same "Principles" he gives instances of Roman roads in Scotland covered with peat eight feet in thickness, which must have got above them somehow since the Romans left our own little isle. What would the Frenchman's scale make of this eight feet? But Sir Charles seems to forget these facts, and all kindred ones, in his present hunt after very ancient men. And yet it is not so much his forgetfulness of what occurs in his other works, as his failure to see the force of the facts which he is actually writing down at the moment, that is so astonishing. For example, he says that, "At some depth in certain places in the valley near Abbeville, the trunks of alders have been found standing erect as they grew, with their roots fixed in an ancient soil, afterwards covered with peat." This is a clear case of the peat flowing in upon the site of the alders, and that might occur in a night. Mosses are sometimes known to burst, and to send forth a stream of semi-liquid peat, which engulfs all over which it flows. Sir Charles himself says that "both in England and Ireland, within historical times, bogs have burst

and sent forth great volumes of black mud, which has been known to creep over the country at a slow pace, flowing somewhat at the rate of ordinary lava-currents, and sometimes overwhelming woods and cottages, and leaving a deposit above them of bog-earth fifteen feet thick."\* In such cases trees are covered up as they grow, and are preserved in the peat in the carbonized state in which they are found when the peaty mass is removed. But all this is forgotten in the estimates of these geologists, and the thirty feet of peat in the deepest hollows is taken as that by which to measure the growth of the mass as a whole!

We have said enough to show that this argument from the growth of the peat can prove nothing in favour of any antiquity of man such as would carry us back beyond two thousand years. Apart from other evidence it would not carry us back one thousand. If a moss in which the men of Ross-shire could dig peat was formed in less than fifty years, and if hollows even of fifty or a hundred feet can be filled with a peaty overflow in a single season, or even in a day, it must be idle, if not worse, to argue for anything like vast antiquity for the race of men from an imagined slowness in the increase of those peaty deposits, in which remains of his works are found. If those who would be regarded as "educated" and "scientific" are to continue to have the slightest claim to be looked up to by the less-favoured multitude, they must refrain from depriving that claim of all substantial force by refraining utterly from all such logic as that which would even tolerate

\* Antiquity of Man, p. 32.

such fancies as those with which we have had to do here.

In this chapter we have confined our remarks to the supposed evidence for man's great antiquity from the slowness of the growth of peat, and to that point alone. Our object has been to show the hollowness of the reasoning by which it is sought to establish any great antiquity for the peaty accumulations themselves from the rate of that growth. Other arguments by which it is imagined their great antiquity is proved will fall to be considered in their turn. In the meantime we think we may rest fully satisfied that, so far as this department of the reasoning is concerned, the Bible account of man has nothing to fear.

## CHAPTER VIII.

## THE ARGUMENT FROM MUD.

IN considering those parts of the earth's surface in which relics of human beings are found, the mud banks and deltas of rivers naturally follow the accumulations of peat. Both of these formations are comparatively recent, and yet many instances of them are unquestionably ancient, so that the imagined slowness of their growth has been used to prove an age of the human race on earth vastly beyond the Bible period. Any one, who has intelligently observed a stream flowing with some degree of force through an earthy soil, is aware that such a stream is muddy—that is, the water, instead of being pure, is mixed with soil, which is borne along with the river over whatever surface it flows. Whenever this stream becomes comparatively still, the earthy substance, which has been mechanically mixed with the water, sinks and settles on the bottom over which the river is then only very gently passing. This is so far the formation of a muddy deposit, which will remain, unless the stream is again brought over it with sufficient force to raise it into a state of mixture with the water, and so to carry it away. When the river is flooded, and rises so as to flow over the level country which lies along its banks, and there to lie all but still over the surface of the

land, the mud is laid down on the level plains. When the water slowly leaves the land, over which it has stood for a time, the deposit is left as a stratum or layer, on the former surface. This is the case, for example, with the valley of the Nile in Egypt. Every season, as the muddy waters of that wonderful river overflow the valley, an addition is made to the surface of the land by the mud left on the subsidence of the inundation. When the river flows on, laden with mud, till it enters some large lake, or till it enters the ocean itself, the water of the river is arrested by that of the lake or sea, and the mud settles at the bottom near the place at which the stream has been so arrested. This causes the gradual formation of what is called a delta, or triangular accumulation of the earthy and other matters brought down by the stream. It becomes triangular in shape because the heap of mud tends to divide the stream, so as to make one fork flow along one side, and another fork along the other, while the lake, or ocean, fences up in front, and makes the third side of the triangle. If the river is continually muddy, this delta is continually increasing in size. If the river is powerful enough to bring down large quantities of matter (sometimes great numbers of trees and other wreck), the delta will increase with greater rapidity. If the stream is muddy only at occasional floods, perhaps only once a-year, the growth of the valley flooded, and of the delta, will be affected accordingly. It will be easily seen that the accumulations of mud, thus going on at a vast number of points on the surface of the earth, must have had buried in them many of the relics of the

human race ; and, in so far as we may be able to calculate the years during which the accumulations have been gathering, we may come to something like the date at which particular relics were imbedded in them.

Geological speculators as to the age of man on the earth have been most zealous in their use of these mudbanks and deltas, and have given us various specimens of their reasoning and calculation, to which the attention of the lover of the Bible is very forcibly directed. One of these is found in what Sir Charles Lyell calls a "most elaborate calculation, made by M. Morlot respecting the delta of the Tinère, a torrent which flows into the lake of Geneva."\* A railway cutting, a thousand feet long and thirty-two feet deep has been made through this delta. This cutting shows the structure of the deposit to be very regular, and exhibits three layers of vegetable soil which must each have been at one time, and for a considerable period, the dry surface of the delta. One of these layers, about five inches thick, was four feet below the present surface, and contained Roman tiles and a coin. Another layer was six inches thick, and stood at ten feet below the surface. It contained a pair of bronze tweezers and fragments of unvarnished pottery. The third was six or seven inches thick, and stood at nineteen feet of depth. It contained fragments of rude pottery, pieces of charcoal, and a human skeleton having "a small, round, and very thick skull." It cannot be too carefully remarked that we have no difficulty with the mere *facts* of these writers,

\* *Antiquity of Man*, p. 27.

with whom in this discussion, we have generally to deal. It is not their observations of mere fact that is defective. But when we leave the bare facts which they have observed, and enter upon their reasoning and calculations, they seem to us to have lost the very notion of what reasoning and calculations are. This is signally manifest in the case now in hand.

M. Morlot assumes that it has taken at least sixteen centuries to lay down the last four feet of this delta. This gives a rate of increase amounting to only one foot in 400 years—that is about an inch in thirty-three years—or only the thirty-third part of an inch in each annual season! This is the rate imagined, too, on the assumption that the increase is regular. Sir Charles Lyell says that the stream “is annually making small additions to the delta,” which is “composed of gravel and sand.” But an “annual” addition which does not amount to the thirty-third part of an inch in thickness is inconceivable even of sand—much more of gravel! Let us be careful in our consideration. It is of immense importance to note effectually the proofs of a certain state of mind in the speculators, as well as the proofs of comparative youth or age in the race of men. The structure of the formation under review is so regular that it implies “a very gradual accumulation, and that, by the uniform action of the same causes.” Well, sixteen, “or,” (as M. Morlot says) “eighteen” centuries to the growth of four feet gives us an annual addition of less than the thirty-third or thirty-seventh part of an inch—that is, less than half a sixteenth! We are

gravely taught that a mountain torrent rushing down from the Alps, and bearing all before it in its flood-times, lays no more on its delta than the depth of half a sixteenth of an inch of "gravel and sand!" Let us try. We shall go, if possible, to a torrent of the kind when it is in full winter flood, and watch the amount of sand and gravel which it is carrying along with it. Say we take up a spadeful of this as it has been laid down where this torrent comes to comparative rest. We shall examine the material, and then come to the conclusion that a layer the thickness of the thirty-second or thirty-seventh part of an inch is all that the torrent has laid down in the course of a year! And we are to believe this on pain of being put aside for having failed to rank among the "educated classes!" We are to believe it because some fragments of glazed tiles and a Roman coin were found in the first layer of vegetable soil, as if it were impossible to believe that these things could have got there at a later date than 1600 or 1800 years ago! Can any one conceive of anything by which the absence from a mind of all true reasoning is proved, if such an absence is not proven by this? We proceed. The second layer of vegetable soil was ten feet deep, and had unvarnished pottery and "a pair of tweezers in bronze"! We take no exception, as we have said, to the facts, for we thoroughly believe in the honour of the men, whatever we may think of their logic. These bronze tweezers are, according to M. Morlot, between three and four thousand years old! The speculator reaches this result over the head of the absurdity noticed of an annual



increase of less than half a sixteenth of an inch, and by allowing something like a millennium to the "bronze" period, when the vegetable soil was in use by man. But both of these assumptions are only monstrous fancies, without the shadow of a ground on which they can be rested. Only look at this. A thousand years for the accumulation of six inches of vegetable mould! Let a stream diverge into an unwonted course, where vegetable soil is in its way, and it will lay down six inches of that soil on its delta in a few hours. On what conceivable data are we to argue that it took a thousand years to lay down this? Or, how do we learn that it lay a thousand or fifteen hundred years after it was laid down? Where was the Tinère all this time? But we proceed. In the third layer of soil, at the depth of nineteen feet, there lay the skeleton of a man, with a small round head and thick skull, together with rude pottery. Poor fellow, whoever he was, he did not belong to the imaginative classes who speculate on his bones, for their skulls must be very thin, and their regions of imagination anything but small. So they put him back another 5000 years! Nine feet, at the rate of one foot in 400 years, requires in itself three thousand six hundred; but then there is the "bronze period," in which the second layer of soil was laid down and trod by human feet, and that must have ten, or, perhaps, fifteen hundred years to itself! So from the whole of this reckless calculation this third or "stone period" of the margin of the Lake of Geneva is put back above 9000 years! The whole thirty-two feet, at the rate of a quarter of

an inch in a year, would require only 1586 years for its formation—but it is thought to have required, with its intervals of repose, at least 9000 ! Was there ever a conjecture more thoroughly wild ? And yet by such wild conjectures we are expected to set aside, as obsolete, the Bible history of man ! This same delta of the Tinère furnishes the ground of one of the soberest calculations in Sir Charles's volume ; but who can fail to perceive it is utterly unworthy to be spoken of in the name of science ?

The delta of the Nile, as dealt with by another Frenchman, furnishes a second illustration of this wild mode of reasoning as to the age of man on the earth. An instance is given in which a fragment of red brick was found in a boring seventy-two feet deep, between two and three feet below the level of the Mediterranean. M. Rosiere takes the rate of growth of the Nile delta at two inches and three lines, and Sir Charles Lyell supposes two inches and a half, in a century. On this ground he calculates that this brick was buried in the soil or mud 80,000 years ago. Thus man, as a brick maker, is seen in this conjecture to have been on the earth some 28,000 years before Adam was created. But will the ground for Sir Charles's calculation stand anything approaching a careful examination ? The rate of two and a half inches in a century gives the 40th part of an inch only in a year ! No wonder that Sir Charles himself abandons the Frenchman's idea. He remarks that " Herodotus tells us that in his time these spots" (not on the delta, but in the valley,) "from which the Nile waters had been shut out for cen-

turies appeared sunk, and could be looked down into from the surrounding grounds which had been raised by the gradual accumulation over them of sediment annually thrown down." Instead of two and a half, or even five inches, in a hundred years, which, at the highest, would only give the twentieth part of an inch in a season, this would lead us to a scale of feet for the century instead of inches. And when we take Captain Speke's description of a Nile flood, as he saw it rushing down the higher portion of this vast river, and remember that all that is borne along by the water till it reaches the delta must be lodged there, we can scarcely help the conviction that these minute geological measurements of deposits must have some strange bewildering bias in the minds of those who invent them to account for their character.

The most important of all the accumulations of mud to which attention has been called in connexion with the age of man upon the earth, is that formed by the Mississippi. The delta of this great river covers an area of many thousand square miles. It has required, according to an estimate of Sir Charles Lyell, above 100,000 years for its formation. If we assume that the delta in question is, on an average, two hundred feet deep, this estimate will call for five hundred years as the time for adding a single foot to its surface!—only the fifth part of a foot—less than two inches and a half—in a century!—less than the fiftieth part of an inch in a year! The reader will observe how the power of fancy grows in this wild logic. First the thirty-second part of an inch in a year—then the fortieth part—now the fiftieth part! Can any

man in his senses soberly look at this as matter of fact and worthy of being associated with the name of science? Yet we shall see that all-important conclusions are derived from it. In one part of this delta, at a depth of sixteen feet from the surface, "beneath four buried forests, Dr Dowler found some charcoal and a human skeleton." The worthy doctor ascribes to this man, whose skeleton was thus found, an antiquity of 50,000 years! Sir Charles Lyell says that he "cannot form an opinion as to the value of the chronological calculations" by which this result is gained. We think he might be able to form a very strong opinion on the subject if he were earnestly disposed. First of all, to take the growth of the mud—50,000 years for sixteen feet! This beats Sir Charles with his 100,000 years for the several hundreds of feet in the whole delta, and beats him hollow. But then there are "four forests," only these are packed in less than sixteen feet of space, for we must allow something to have lain above the uppermost of the four. If these "forests" grew on the spot, we must have soil for each to grow in, as well as space on which it could lie, and all this in less than sixteen feet! Yet we must give 50,000 years to this miniature formation in geology! A stream capable of burying forests, so as to pack four of them in less than sixteen feet of vertical space when forming its delta, is to be, nevertheless, allowed not less than five centuries to lay down twelve inches of mud on the surface! And we are to regard all this as sober science, destined to lead us to greatly "advanced religious views," and as far beyond the

teachings of Moses, as "the educated classes" could wish to be ahead of the common multitude! We have had to read Sir Charles's statements over and over many times in order to believe our own eyes that he had really published to the world such monstrous examples of speculation. And yet such is the fact; with the solemn gravity of a high priest of science he spreads out his marvelous cogitations, and satisfies too the credulous souls, who will trust anything rather than the Bible, that man has been on the earth for hundreds of thousands of years!

Let us just take one fact adduced by Sir Charles Lyell himself, and one which is pregnant with force against these reckless speculations. Speaking of a fossil bone which was found near Natchez, he says—"Owing to the destructible nature of the yellow loam, every streamlet flowing over the platform has cut for itself, in its way to the Mississippi, a deep gully or ravine."\* He mentions one of these ravines which is seven miles long, and, in some places, sixty feet deep, which had no existence before 1812. There was an earthquake at that date which shook the land all about Natchez, and so far accounted for some of those fissures that had been cut so deeply; but Sir Charles saw when he was there that the streams were widening and deepening all their channels, and consequently carrying immense quantities of mud into the river, which was, in its turn, bearing it on to its delta in the Gulf of Mexico. Yet he could coolly calculate that all this would allow of only something less than the fiftieth part of an

\* *Antiquity of Man*, page 202.

inch of sediment laid on the surface of that delta in an average year !

We are confining attention in our argument thus far to the *growth* of strata, and the time to be regarded as necessary for that growth. We do not, and will not, ignore any other part of the supposed evidence given for man's great antiquity. But to reason satisfactorily we must keep the different parts of the reasoning distinct. It is by no huddling together of the false and the true that any trustworthy result can ever be attained : nor is it by attacking at random a mixed multitude of fallacies that a false result is to be removed. We have taken up the accumulations of peat and of mud, and we think we have seen, that so far as the time required for the growth of these is concerned, the arguments for a greater antiquity to the human race than the Bible teaches are utterly unworthy of a sober understanding. Whatever other arguments are adduced, they may be fairly dealt with ; but they cannot be allowed to have their weight in any degree increased by an imaginary countenance derived from the fancied slowness in the accumulation of these strata. He who has permitted his scepticism, in regard to the Sacred Scriptures, to be in any degree strengthened by such reasoning as that which we have examined must have allowed himself to be very easily led astray.

## CHAPTER IX.

## THE CONTRACTION OF LAKES.

THE growth of peat, and the accumulation of mud are naturally followed in our discussion by the consideration of some of the sites of those Swiss lake-dwellings, on which Sir Charles Lyell discourses at very great length. It is still the custom of tribes of men to erect their habitations, in one way or other, on or over the surface of water. The Papoos in the Bay of Dorei, in New Guinea, are instanced as doing so in a way similar to that which had, it seems, been followed by very ancient inhabitants of Switzerland. "The habitations on the coast are built on piles, with a sort of bridge extending above high water mark; a dwelling of this kind is occupied by several families." Such was the mode of building in the "old times" of the Swiss lakes. The plan was to drive piles into the bed of a lake at some distance from the shore—to build wooden houses on the top of these piles—connecting the dwelling with the dry land by a long narrow bridge that could be easily withdrawn. In the Swiss lakes the piles, on which many habitations of this nature had at one time stood, are still found sticking fast in the mud, and vast numbers of tools and weapons, with other relics, are found on the sites which are marked out by these remains. There are only two really

tangible attempts at chronology in all that Sir Charles writes on the subject of these lake-dwellings. The first is founded on the remains of an ancient settlement of this kind, found in a peat bog at Chamblon, on the Lake of Neufchatel, and the other on piles that occur at the Pont de Thiële, near the Lake of Biennne.\*

We shall glance at the first in order, which is the least important of the two. The ancient Roman town of Yverdon, which was once on the border of the Lake of Neufchatel, is now 2500 feet distant, on account of a belt of newly gained land of that breadth which comes between it and the water. It is held that these 2500 feet of land, when taken along with the time that has elapsed since the days of the Romans, are a measure of the rate at which the lake has contracted since its creation. The pile works in the bog at Chamblon are so much farther from the present border of the lake, and this greater distance is believed to measure the time which has passed since these piles were driven. That is, if 2500 feet of dry land has been raised in the fifteen centuries that have passed since the Romans built the town of Yverdon, how many centuries passed away while the dry land between that town and the dwelling on piles in the bog was being raised in a similar way? Sir Charles's idea is that this dry land is all the result of the one cause which fills up the lake with "river sediment." This filling up, as he imagines, has taken fifteen hundred years to raise 2500 feet of dry land, and, therefore, it must have taken so many more hundreds of years to

\* See *Antiquity of Man*, pp. 28, 29.



raise a greater breadth. We shall see the importance of observing this chief feature of his argument afterwards. We are not favoured with the details of the calculation, but the result places the date of the lake-dwellers back 3300 years from the present day. The period from the time of the Romans is given as fifteen centuries, and eighteen more are added on account of the more than doubled distance, we suppose, of the lake-dwelling from the water.

The much more important instance, however, on which Sir Charles reasons is that connected with the Lake of Bienne. The old convent of St. Jean, founded 750 years ago, and built originally on the margin of the lake, is now at "a considerable distance" from the shore. This distance gives, according to certain Swiss geologists, "a measure" of the growth of land during these 750 years. Then there are the remains of a pile dwelling at Pont de Thièle, which is at a so much greater distance from the shore that, if we assume a similar rate at which the water was converted into marshy land, during the more ancient period, we must add sixty centuries to the seven and a half, and hence conclude that these inhabitants of the wooden houses lived there 6750 years from the present time! Sir Charles does not condescend to favour us with the details of calculation here any more than in the former case. But he indicates pretty clearly the one general principle by which the conclusion is reached. His one idea, so far as the growth of land, or morass is concerned, is that of the filling up of the lake with river sediment. He suggests no other geological

process. He sees no other in the geological reasoning of his Swiss friends. Yet he manifestly regards the reasoning as something worthy of scientific regard. We must, therefore, give it due consideration.

The simple line of argument is clearly this :— It has taken 750 years to fill up the Lake of Biemme, so as to form the strip of land which now lies between its waters and the old convent of St. Jean. But the distance between that old convent and the Pont de Thiële, where are the piles of the ancient lake-dwelling, is eight times that between the lake and the convent, so the time for the formation of the morass which occupies that space must be eight times 750, or 6000 years—the time for the whole distance, 6750 years. We have now to test the validity of this reasoning.

Every one who has paid any attention to such subjects is aware that lakes are in process of being gradually filled up. Their depth is in course of being lessened, and their area is being gradually contracted. Especially when surrounded by lofty and extensive mountains this process is going somewhat rapidly on. The surface of these mountains is being washed down into the lakes, and is lodging there. Every flood brings down large quantities of material for the filling up of the lakes. This material lodges chiefly near the margins of these lakes, little and often none of it reaching the deeper parts of their basins. This is, however, only one of the means by which the area of lakes is contracted. The growth of plants, and the formation of bog through their growth, is also going on, and helping the process by which

the lakes are lessened in size. No one can doubt the reality of these processes, nor need any one despise the results as a somewhat rough and extremely uncertain measure of time. There is a third most important part of the process by which the area of lakes is contracted, but we leave it for another part of our consideration. If we would enjoy the slightest claim to be accounted men of sense, not to say men of science, in conducting a momentous argument like this, we must reason correctly on all the main facts that affect the process in hand. If we at all understand Sir Charles Lyell, and those from whom he derives his argument, they reason in this as in other cases most wildly.

First of all, we notice the great omission in the reasoning, which allows it to be taken for granted that the process by which a lake is contracted by filling up with river sediment, is equally rapid from its commencement all through. As a rule all lakes are shallow at the margin, and go on deepening more or less as we leave the shore. We have an illustration of how they fill up when we see an embankment in course of being carried across a valley. At the outset a few waggon loads carry the work farther forward than as many hundreds of waggon loads carry it when it has made more progress. The upper surface has to be kept up to the level, and hence as the valley deepens the work becomes tedious. It is emphatically so with the contraction of a lake. It is almost incredible that this should be completely overlooked by such a man as Sir Charles Lyell, yet he manifestly overlooks it, and argues as if the Lake of

Bienne had been as deep at its ancient margin as it then was where the old convent of St. Jean now stands, and even at that considerably greater distance from its ancient shore, at which we meet its present waters ! The same overlook is manifest in his reasoning on the Lake of Neufchatel.

Let us take an illustration from the progress of an embankment and an imaginary calculation as to the time of its formation by the same forces. Say that it runs a mile along a very shallow part of a valley, and then has to pass over a part five times as deep. It requires a month to carry it forward fifty yards over this deeper part of the valley, and we inquire how long it took to carry it over the 1760. Forgetting the shallowness of the first part of the valley, we conclude that it took about three years and ten months ! It may not have taken the half of the ten months. How can man ever reach a sound conclusion by means of such a mode of reasoning as this ? That part of the Lake of Bienne which originally lay between the Pont de Thiële and the present site of the old convent may have been filled in less than the half of the time it has taken to fill the portion now between the convent and the lake, instead of requiring eight times as long.

But to see this more fully, we must notice another important omission that is as flagrant as this first one. The amount of material coming down from the mountains is vastly greater in the earlier stages of denudation than in those of later date. The mountains are higher—the slopes are steeper—the snows and rains are heavier—the floods are more powerful in proportion as we go back in the

history of the recent formations. The consequent amount of sand and mud is greater, and marshes are more speedily formed. The bog and dry land follow also much more speedily. His ideas of physical geography are certainly very defective who is not alive to this truth. But Sir Charles reasons as if such a truth were a falsehood, or at best—nonentity. Just as he forgets the comparative shallowness of the margins of the early lakes, and the depth of what was (then to be) later margins, so he forgets the slowness of denudation, as it affects the older mountains, and fills so much more slowly the deeper portions of remaining lakes. Is there not a fatal defect in a state of mind that admits of such glaring omissions? Is it a fair result of superior culture when the “cultivated” conjecture so wildly, instead of reasoning with a care that would not leave a fragment of the truth to be overlooked? Beyond all fair questioning, we have a *right* to look for a very different treatment of subjects, on the reasonable discussion of which so much depends.

And yet there is a third and far more serious overlook in this reasoning on the growth of land at the margin of these lakes. There is a lowering of level in the waters as well as a growth of land. But for this the shores could not stand high above the present waters as they now do. The *outlet* of the water is deepening as surely as the waste from the mountains is finding its way to the bed over which that water flows. But the wear of rock at such an outlet may be much more rapid at one time than at another, and will be greater in proportion to the height of the outlet, and the consequent

rapidity of the fall by which the lake water leaps into the river below. It cannot be doubted that by means of a sudden giving way of the barrier at the outlet of the Lake of Bienné the ancient inhabitants of the wooden houses on the piles might find themselves living above only swampy ground, instead of above water, in the course of a very brief season of change. The greater part of the distance converted into a marsh, to which our attention is thus directed, might be denuded of its watery covering in one year, instead of requiring sixty centuries ! It is to be observed that it is yet only a "morass" which lies between the old convent and the Pont de Thiële, and it would require but a comparatively small lowering of the water to produce it as a change from the clear, full lake over which the pile-supported village of the "stone period" originally stood ; but this feature of the case is lost sight of entirely in the reasoning of Sir Charles and his friends. They reason as if the depth of the lake had no variation—as if the supply of river sediment were uniform—and as if the level of the water had not been lowered. Is it possible to reach a sound conclusion in such a way as this ?

"M. Morlot, after examining the ground, thinks it highly probable that the shape of the bottom on which the morass rests is uniform." The object of this remark is to suggest the idea that the mere matter of distance between the old convent and the ancient piles is a fair measure of the time during which the lake was being filled up. But what in reality has this uniformity to do with such a measure ? Let us assume that the lake

at this point was all of one depth, and the bottom perfectly level. It would require only a few feet of deepening at the outlet to reduce the whole to a morass in a very few years. There must have been such a lowering of level too, or the convent could not have been built where its ruins now stand. Sir Charles Lyell calls this uniformity of bottom an "important point," to be verified, if possible, by "boring;" but it is important only in the wild system of conjecture in which all is important that can favour a certain hypothesis, and nothing else is worth notice! Here is this ancient foundation of a village that stood above the surface of water that has been drained off, leaving a morass to take the place of a full lake. This morass has had at least 750 years to grow. We may give it 750 more if you like, or you may add 750 to that if you so will, but to argue that because the old convent is a certain distance from the margin of the lake on which it stood, and the Pont de Thièle is eight times further, therefore this morass has been growing for 6000 years beyond the 750, is sheer folly. No man who cares to see anything like logical cohesion in what he believes will be caught by such reasoning.

Sir Charles occupies a great many pages with statements regarding the remains found on the sites of these lake-dwellings. His desire apparently is to show that they belong to different ages of stone, bronze, and iron. He seems to us to have proof enough for the idea that three great stages of human progress were passed through by those lake dwellers. Those who knew only stone weapons and tools had one class of animals in

use—those who knew bronze had a better class—and those who knew iron a better still. But the fullest establishment of these ideas does literally nothing to indicate that these inhabitants of Switzerland lived even three thousand years before our own day. No remains of animals have been found on the sites of their dwellings but such as are known to have lived in Europe within the last two thousand years, and none of the material of their implements differs from that of those who live on the earth at the present time. If the careful spirit of true science prevailed, and held men fast to the stern work of knowing truth, and only truth, it would be impossible for them even to broach such conjectures as those with which we have here to deal. We must cultivate this spirit, or science itself will suffer. If in the works of scientific men we meet only with conjectural dreams, and find out that we are not enriched with real knowledge, but simply inflated with vain speculations, that vanish at the touch of sound reasoning, men will get sick of science, and fall back upon superstition. Only look at those specimens of reasoning over which we have already passed, and think how they must affect the truly inquiring mind.

It is wonderful that the glorious realities of revelation should be given up by any one in view of such maundering. God our Father is converted into "the Deity," of whom nothing whatever is known that can help the guilty or console the desolate heart! The "blood" that has spoken peace to millions becomes obsolete, and we are left to appease the burning curse of self-con-



demnation as best we may, and all this on the ground of a so-called "science" which has not a leg to stand upon ! We confess that we know not whether to be more ashamed of the poor condition of the intellect, or more sorry for the state of the heart which such calculations reveal.

## CHAPTER X.

## BEDS OF GRAVEL AND SAND.

WE are still confining attention to the growth of those inorganic masses, in which relics of man are found on the face of the earth. Having gone carefully over the arguments derived from the growth of peat, and the accumulations of mud, with the encroachments of land on sheets of water, we come now to the more important beds of gravel and sand, in the depths of which the flint tools of primitive workmen, and the weapons of very ancient warriors have been, and are still in course of being, discovered. As we approach this part of our subject, we are naturally impressed with those fresh ideas of the course of terrestrial change, which seems almost to teach us something like an everlasting round in the formation of the various substances that constitute what is called "the crust" of the earth. The mould and mud, forming in such vast masses on the surface now, are, when considered in their present character, undoubtedly *new*. The gravel on which these masses are laid is undoubtedly, as gravel, much *older*. The rocks from which that gravel was formed are again unquestionably *older still*. The rocks from which the sand and other materials were taken to form what are called sedimentary strata must be older again than these stony beds

themselves. But when we go back to the last link in this sort of chain, and look at the "*gneiss*" or at the "*old granite*," we are now compelled to remember that masses of these are probably now in the course of formation, and that, too, out of what may have been mould on the surface. Just as the granite is being converted into sand—the sand into sandstone—the sandstone into something newer, and the various soils into vegetables and animals—so it would seem as if these were on their way back to gneiss and granite again. This gives rise to very bewildering thought, but it ceases to have such an effect when we take a wider view of our field of inquiry. If in considering the dead material alone, and, while viewing it in its deadness, we have before the mind something like an eternal circle, the moment we direct attention to the monuments of life, we have a *history* with its clearly marked beginning in the vastly distant past, and its temporary ending, if we may so speak, at the present hour. If we go back to the Laurentian limestone, with its petrified *Eozoön*, and, beginning there, trace life on the earth through its incalculable generations, up to the time at which we live, with its immortal sons and daughters of the Great Father, all is most strikingly in keeping with the view of gradual elevation given in miniature from the pen of Moses. If we begin at the present and go back, we get but a very small way indeed till we have passed all traces of man. There is no room left in which to fancy or doubt that the human family have had comparatively a very limited stay on the earth. It is on this account that it is so important to sift

the arguments that are used to support the idea of man's vast antiquity from the superficial gravel beds of the globe. The peat and mud, with the marshy land which they form, lie upon gravel and sand that must have been laid down at an earlier date than that at which these accumulations were laid above them, but though older than these, the beds in question are confessedly but as if of yesterday when compared in age with the rocky tombs of inferior creatures.

Any one almost may have for himself an illustration of how a gravelly bed is formed. He has only to look at a stream, say as it descends from a hill-side, or makes its way with some degree of force along a channel where it has a good "fall." The rocks over which this stream has come have been cracked and otherwise disintegrated by the action of the atmosphere, and so in small pieces, perhaps in the finest sand, they have been fitted for being carried away by the water. They are laid hold of and rolled down the bed of the river till their sharp corners are rounded off by rubbing against each other, or on the rocky mass over which they travel. This is the way in which gravel and sand are originally formed from the rock. But this process is not alone in the formation of the great gravel beds, to which it is of greatest importance that we should direct attention. A river passes through soil that is already so far composed of sand and gravel, which has been originally formed in the way we have just described. The water, especially at flood times, loosens this soil, separates its earthy and lighter parts from the more heavy, and so collects quan-

tities of old sand and gravel, which is united with such as is only now being formed from the rock. All this, when the river is flooded, is carried along and lodged wherever the water becomes comparatively still. But flood after flood bears it further and further on down the stream, until it reaches the lake into which the river empties its waters, or until it comes to the ocean itself, and bears its burden into its briny depths. It is thus that we reach the point which is of greatest interest at present in connection with the gravelly records of man's age.

When the river, by which sand and gravel are carried along, reaches the sea, and the tides begin to act upon them, a somewhat different process goes on. The gravel, especially, is then rolled backwards and forwards with every wave, and the separate pieces are rounded and worn to a very great degree. The mass is also spread along the shore to great distances, and becomes mixed with sea shells and other marine productions, so as to have its character considerably changed. Frequently the lower part of the river is a comparatively narrow inlet, through which the sea water rushes at the rising of the tide, forcing back the river water, and out through which the fresh water rushes when the tide falls, or floods give the stream force to drive back the ocean. Long gravelly or sandy beaches are thus formed on each side of the estuary. These are composed of great masses of gravel and sand. But here one most important truth requires special notice. By overlooking it we humbly think that a vast amount of miscalculation has been allowed to enter into the

speculations that have been indulged on this subject. Any one who has access to the sea shore may see the feature to which we refer in the formation of gravelly beaches. These beaches are *double* where they accumulate fully. One is a high water beach to which the rising tide rolls up the sand. The other is a low water stratum, to which the receding tide rolls and washes down such loose materials. On examining any tidal coast we can see these two gravelly or sandy beds in the course of formation now. The one at the high water mark is always easily seen, and the other just within the usual low water mark is uncovered when the tide has gone out unusually far. A high level and a low level bed of gravel and sand are thus formed at the same time, and if the rise of the tide is considerable the one is high above the other as they are laid along either shore. When these beds of gravel have been formed, and the land under and around the estuary is raised above the level of the sea, the tide ceases to increase them, and the river at its flood times, especially when carrying ice down in large quantities, scours out the bottom, and wears away the sides of its course, so as to leave the two accumulations high out of reach of its ordinary waters. When the land has become sufficiently high to shut out the sea from the estuary, and, along with the lessening of snowfalls in the mountains, greatly to reduce the volume and force of the stream, moss and peat begin to grow on its surface, and to fill up by-and-by its deepest pools. At the same time the rains are washing down soil from the mountain sides, and laying a growing

stratum over the gravel and sand that had been collected on the beaches of the estuary or tidal stream. From the river's own action now a gravelly bed is formed beneath it. From the growth of peat, mossy marshes gather on either side of it. The gravelly accumulations are raised more or less on the sides of the valley, and covered with deposits such as can be brought down over them. This whole process is on the obvious condition of one very slight upheaval of the region in which the valley lies.

Such, we must believe, is something like a history of the formation of the gravelly beds in Picardy, which figure so largely in the present controversy regarding the age of man. In the valley of the Somme there are two beds of gravel and sand of the very character of which we have been describing. They lie both above the level of the surface of the peat—the one about thirty feet above the other. In both of these gravel beds flint implements, formed by the hands of men, and similar to those yet in use by the natives of Australia, have been found in great abundance. One thing requires here to be carefully kept in mind. These beds of gravel are not anywhere placed so that the one is over the other. Nor do they lie, so that with a portion of each on one side of the valley and a corresponding portion of each on the other side, they can be seen to have been cut through by the river when deepening its channel. The beds are scattered over the region, only one set at a high tide level, and another at a low tide one. It seems to be placed beyond doubt that men inhabited the valley of the

Somme when these two beds of gravel and sand were laid down by the river and ocean in their combined action ; but that the time of the abode of these men in that land was more than even three thousand years ago is a different affair.

Sir Charles Lyell, after giving an indefinite number of " thousands " of years to the formation of the peat, advances a theory which vastly extends these " thousands " in the imagination, for the formation of the beds of gravel and sand. He holds that there was a time when the river filled the valley, long long ages ago, and the higher level bed was the bottom of the Somme—that men lived then, and that through a vast period, on its banks. They left their flint tools and weapons in the stream chiefly by letting them fall through ice holes which they cut for fishing purposes. Sir Charles seems to be only sometimes alive to the truth, that when the valley in which the Somme now flows was so low that water filled the whole of it, the sea and not the Somme must have chiefly supplied that water. It must have formed a tidal estuary, and not properly a river at all. He thinks of this truth, as we have seen, when he is reasoning on the formation of the peat, but totally forgets it when reasoning on the beds of gravel. So he imagines a time when the land was so low that the river filled the valley, and was frozen over so that men lived on the ice. Then came a time of slow upheaval, and the land rose till the river had time to " scoop out " its bed to the depth of the lower level gravel. It thus left the higher gravel high and dry upon its contracted banks, and was engaged in forming



these lower level beds, laying them down in great masses especially during its times of flood. The river pathway that was at this time hollowed out by the force of the stream stood where the lower level gravels now have their deepest parts. The reader may imagine one great wide river forming the highest gravels—then a much narrower stream forming the next lower, and flowing along the new channel it has formed. That was then for ages the bed of the Somme, and the men who lived in the country left the flints which they still used, to be mixed with the gravel, by letting them fall through the ice into the now deeper course of the stream. Then after long ages came that second upheaval of the land which caused the Somme to scoop out the valley to the depth of the bottom on which the peat rests now, and which continued to rise with almost inconceivable slowness, till the peat had grown and filled up the valley as it now stands, with a small sluggish stream oozing through to the sea. Since then Sir Charles imagines that the land has begun slowly to subside. He has thus two immense periods of upheaval in his scheme of the formation of the valley.

This theory suits Sir Charles's idea of the antiquity of the human race, but it does not fit the facts as they stand in the one point with which we have now specially to do. We shall in due time we trust, attend to all the arguments which are derived from other points—at present we are concerned only with the time required for the formation of the strata in which relics of men have been found. After considering the peat formation, and dwelling at great length on the

character of the flint tools found on the gravel, Sir Charles takes up the lower level bed, saying that "the greater number of flint implements have been dug out of that, often near the bottom, and twenty-five, thirty, or even more than thirty feet below the surface" of the overlying soil. He gives a representation of a section of the strata in which we see this gravelly bed lying under the two superficial beds of earthy matter that have been laid above it. His theory requires that this gravelly accumulation should not have been the extreme low-water beach of a tidal estuary, on which the action of the waves lays down great masses of gravel exactly similar to those in question, but the bed of the river, on which the gravel and sand are laid down all over the space on which the water runs. So he imagines that this bed was first formed by the action of the river, and then "scooped out" by the flow of the stream when the land was upheaved. We are consequently anxious to see whether this point can be logically established. Hence we search very carefully for the strong reasons which Sir Charles has to advance in its favour. We have seen how exceedingly loose are his arguments derived from the growth of peat and mud, and we must say that the same excessive slackness of logical cohesion characterises those from the growth of gravelly strata. Almost the only thing in the form of reason which he gives for his peculiar belief regarding the formation of this bed lying just above the level of the peat is, that it ends "abruptly" and "must have been once continuous further towards the centre of the valley." He says, "a

geologist" will perceive this at "a glance." But "geologists" see many things at a glance that have no existence in reality. There are very many things which Sir Charles saw at a glance, when he wrote the record of them in this very volume, which cannot be seen by the most protracted look now. They will disappear from the next edition of the book, if we are not greatly mistaken. If any one, geologist or not, takes a sensible look at a gravelly beach in the estuary of a tidal river, where the waves have beaten the stones and sand back against the face of a rather steep shore, he will see that it ends as abruptly as that at Menchecourt, on which Sir Charles is remarking. In an estuary, in which the tide ebbs and flows, there is a strong current passing now one way along the beach, and then the other way along the same. This causes the shore to assume the very same appearance in the edges of their gravel beds as is seen on the banks of a river. There is a constant, or all but constant "scour" going on in the water ways of the estuary, at the same time that there is a laying up along the shores of fresh material brought down by the river. Sir Charles's statement, therefore, that this gravel bed must once have extended further towards the centre of the valley is utterly groundless, when founded, as it is, on the abruptness of the edge of the gravelly formation. He says himself that "occasionally a mixture of marine and fluviatile shells is observed" in this bed, "proving that the sea sometimes gained upon the river"—in other words, proving far more clearly that the gravel was a formation on the beach by the action of the

tide, and not one laid down at first over a level surface in a river bed, and afterwards scooped out according to his theory. If, as seems evident, the valley of the Somme was a tidal estuary, when the river was low the sea water would constantly wash the gravelly beaches. Then marine molluscs would thrive. When the river was in flood these would be covered with fresh water, and, dying, they would give place to river shellfish altogether, independently of any fluctuation in the land level of the country, and equally so of any scouring out of the bed of the river. On the understanding that his section may be thoroughly trusted, we must say that the beds of gravel with the overlying loam and clay, are exactly such as we should expect on an ancient tidal beach. They do not end abruptly like "bluffs" that have been left by a deep and narrow river, in the scooping out of its banks. The gravel lies under the level of what would be low water mark when the estuary felt the full force of the tide, and is exactly like hundreds of accumulations now gathering in the estuaries around our own coasts, by the action of the receding tidal wave. If the frost was sufficiently powerful to cause ice to bear up over the water in the estuary at high water, and in times of flood, this bed of gravel would be just the place in the estuary where fishing through ice-holes would be most successful. But we shall leave this point to be considered more fully at a future stage.

Another thing in the form of argument, which Sir Charles advances against the idea that the whole valley of the Somme was merely a tidal

estuary, is, that above Abbeville marine shells are entirely absent from the drift accumulations. The utmost that this proves is that the water above that point was not sufficiently salt for the growth of marine species. It cannot be conceived of as proving that there was no powerful tidal wave coming and going as such waves come and go twice in every twenty-four hours in our estuaries, into which large rivers pour down their fresh water. Fresh water and land shells unmixed with marine, can be found within the reach of the tide as truly as beyond its reach, wherever the fresh water keeps back the salt running up from the sea. The first evidence of the rising of the tide in a river is the flowing back of *fresh* water. The heavier body of salt water drives it up the river. But this fresh water has the same effect on the form of the gravelly and sandy shores as the salt water has. The only difference is that sea shellfish do not live where fresh or brackish water prevails. His argument from this goes for nothing.

Sir Charles says, "We by no means need the evidence of the ancient fossil fauna to establish the antiquity of man in this part of France. The mere volume of the drift at various heights would alone suffice to demonstrate a vast lapse of time, during which such heaps of shingle derived both from the *eocene* and *cretaceous* rocks were thrown down in a succession of river channels."\* But this is not argument. The mere vague impression made on a mind habituated to the very loosest possible generalisations, though that mind has

\* Antiquity of Man, p. 122.

been most industrious in gathering facts, can never be accepted as trustworthy truth, in view of which we are to abandon our Bibles, and follow instead Dr Colenso and the authors of the "Essays and Reviews." Sir Charles has concluded that these masses of shingle were not accumulated on the shores of an ancient estuary by means of the power of the tide, but by the slow action of a quiet river spreading them along its bed, and he fancies consequently an immense time for their accumulation. His fanciful thought which is so vast in its dimensions, rests on a fanciful foundation, and there are indeed no limits to speculation when all is so thoroughly matter of fancy. But the careful thinker will never be misled in such a way.

And yet it is of great importance that we look into the nature of this mode of reasoning. A man who has devoted a life and a fortune to the collection of geological facts is necessarily, in the language of ordinary life, "an eminent geologist." He may be trusted as a man of the highest honour who would not for anything state that as a fact which he only knows as a probability. We feel the greatest confidence in taking his statements of pure fact as statements of reality. His treasures of fact are incalculable, and incalculably precious. Yet he has perhaps never spent a serious half hour in endeavouring to master the most essential laws of true reasoning. He looks at a great mass of shingle, and asks himself how long it took to gather such a mass together. For an answer he consults the oracle of his own misled imagination, and his impression being very vivid that it took ages on ages for the work, he holds

that impression to be nearly equivalent to a demonstration ! The man who is guilty of such a blunder as this in the course of an argument on which the very greatest of human interests are hinging, is manifestly incompetent for the task he has undertaken. He is as eminently illogical as, in a sense, he is eminently geological, and hence he is incompetent. Surely something else than such an impression on such a mind is to be looked for as true. And yet we look in vain through and through Sir Charles's reasonings on this most vital part of his argument for anything more satisfactory. It is clear enough, even from Sir Charles's own statements of fact, that what is now the valley of the Somme was once a tidal estuary, in which the sea and a river, or system of rivers contended, so to speak, for the mastery, and in which ice had a most important part to play. Two gravelly and sandy beaches belonged to this estuary, one along the high water shore, and one within the ordinary low water mark, and men using flint tools and weapons lived in the country around. This country has been raised many feet above its former level by the usual igneous, or other agency beneath ; but that this process took some hundreds, or even scores, of thousands of years for its accomplishment, and consequently that men lived on the earth at so vastly ancient a date, is a purely gratuitous imagination. Instead of its being demonstrated, there is not one solid argument advanced in its favour.

The interests that are wrapped up with the actual truth of Scripture history are incalculable. If we must abandon these, millions of hearts, now

happy and heroic in immortal hope, must be sunk down into the misery of dark despair. The self-complacent speculator cares little, perhaps nothing, for this, but so much the more foolish must men and women be if they allow that speculator to bereave them of their most priceless treasures by means of groundless dreams. It is as truly a fact that millions have been made happy and good, by means of the truth revealed to us in the Bible, as it is true that there are gravel beds and flint hatchets in the valley of the Somme. The happiness and the goodness so produced depend for their existence on the trusted reality of Bible history, and dreadful indeed would be the day in which the millions would be reduced to the necessity of finding their happiness and goodness elsewhere than in the Word of God. If we must come to that day, it certainly ought to be by means of some mightier force driving us on than that which is found in the bewildering imaginings of conjecturing speculators. Surely we may ask at least for something more solid than vague impressions palmed off as demonstrations, and the effect of glances, as the fruit of resistless truth.



## CHAPTER XI.

## FORMATIONS FROM ICE.

THERE is an argument for the vast antiquity of man by which it is thought that the date of his first appearance on earth is carried far beyond that of the gravel beds of Picardy. This is derived from the imagined or anticipated discovery of human relics in or beneath the peculiar deposits that have been laid down on the surface of the globe by means of mountain ice, or by the melting of floating icebergs. In the geological history of Europe we have been taught, by a geological theory that seems about to give place so far to one of a different nature and bearing, that there was a period when all that which is now dry land was covered by a sea, which bore on its bosom immense quantities of floating ice. In reference to Scotland, Sir Charles Lyell contends for a submergence of its mountains under this icy ocean to the height of at least 2000 feet. The huge boulders, or pieces of rock that have been laid down over our fields, and even on our highest hill-tops, have been adduced as evidence of the prevalence of this "glacial ocean." The markings on rocky surfaces, so well known to geologists as the ruts grooved in those surfaces by the sharp points and edges of the stones or masses of rock enclosed in icebergs which, it was thought, had

floated over them, convinced men of the highest standing that an icebearing sea had, in the glacial era, covered the North of Europe. The "clay," which is full of these stones or boulders, and is called "boulder clay," or "northern drift," has been regarded as evidence of the same submergence of the land. We are not sure that even the show of an argument for man's vast antiquity can be raised out of this glacial age, taken in any view ; but a great deal is made of it in Sir Charles Lyell's volume, and we must at least look carefully into his reasoning that we may do justice to his efforts, and to the great subject involved.

Sir Charles says—"It often happens that when, in any given region, we have pushed back our investigations as far as we can, in search of evidence of the first appearance of man in Europe, we are stopped by arriving at what is called the 'boulder clay' or 'northern drift.' This formation is usually quite destitute of organic remains, so that the thread of our inquiry, into the history of the animate creation, is abruptly cut short." He thinks that we can push our inquiries as to the age of man beyond certain eras at which we are brought to a stand still by this "boulder clay," as it lies in certain places, (such as, for example, in Denmark,) but that, where we can go back to the furthest limit, the formation just ahead of us is still this same clay, though at a different part of Europe, as for example, at Bedford in England. We have thus Sir Charles's own authority for saying that no relic of man has been found in this clay, nor has any such relic been found in a bed *over* which this "northern drift" has been laid.

He does his utmost to turn the edge of this negative fact, as we may call it, by saying how rare "human bones and works of art are in all strata, whether marine or freshwater, even in those formed in the immediate proximity of land inhabited by millions of human beings," and how much more rare they must be in glacial drift from its being "a few wanderers" at most, who could have left their bones or implements on glaciers or in an ice-bearing sea. But, in spite of all that this can really signify, we stand at the gap which Sir Charles indicates, and look beyond in vain for traces of man. There are abundance of relics of other creatures beyond this zone of clay, and there are also the remains of regions in which man, as we shall see, *might possibly* have lived in Europe over which certain boulder clay has been laid; but, although it is confidently anticipated that relics of human art will yet be found in these, they have not been found, nor do we see the shadow of a ground for the anticipation that they will.

In dealing with this part of the subject, Sir Charles Lyell's all-important instance is found at parts of the Norfolk and Suffolk seacoast, between Weybourn and Cromer. After great storms an immense quantity of shingle, usually lying on the beach, is found to be cleared away, and the strata thus revealed are of great geological interest. Lowest of all is seen the "fundamental chalk," with its flints forming, so to speak, the groundwork of the whole. This Sir Charles calls also the "upper chalk." What he intends by calling it "fundamental" in the one case and "upper" in the other, seems to be to indicate that this

stratum forms the foundation here, but belongs to that class of cretaceous rocks called the "upper" in relation to older rocks of a somewhat similar composition. Above this chalk is a forest bed, in which are seen the stumps of ancient trees, some of them two feet in diameter, with their roots still fast in the soil in which they grew. Both of these formations are below the level of "the beach line," or, as we understand it, high-water mark. Laid above this bed of the ancient forest is a mass of fine sand and clay in thin strata, and mixed with "lignite"—that is, vegetable matter, such as tree leaves and brushwood turned into a sort of coal. This mixture contains the shells of marine molluscs, and must have been laid above the buried forest by the sea. Above this again is "boulder clay"—that is, clay which has been originally laid down by means of melting ice, carrying in it pieces of rock broken off from the mountain sides on which the ice was formed. This clay with its "boulders" is, as we have seen, the all-important part of the formation; as it is held to mark what is called the "glacial period," when much of Europe was thought to have been entirely covered by a sea that bore on its tides vast icebergs, and great quantities of frozen materials. Beyond this period geology, as Sir Charles has told us, has hitherto failed to track the history of the human race. Above this boulder clay, at Cromer, are strata of "drift" and "gravel," such as are not doubted to come within the human period in the history of their formation.

We feel peculiarly interested in this Cromer section of the earth's crust. Here is a forest,

which seems to indicate that when it grew the climate of the place was *possibly* suitable for man. We are not sure that it was *actually* suitable. This is one of the things that are ready to be too easily taken for granted, but it may be conceded as quite a possible truth that if men had been on the earth, and in this part of it, they might have roamed in this ancient forest, and hunted the elephant and rhinoceros, or other creatures that did inhabit the region at the time. This forest has been overwhelmed by the ocean—by a muddy and sandy tide—that rose over it and covered its stately timber with clay and sand so as to convert its leaves and branches into lignite. A sandy beach, of many miles in extent, afterwards took the place of this ancient wood; and marine shellfish lived beneath the waters where forest beasts and birds had lived amid the umbrageous trees. Then came the ice-bearing ocean, as Sir Charles would have us to believe, with its loads of clay and rock laying down its deadly burden over the mollusca. This freezing time passed away, and warmer days and rains brought the present covering over the complicated grave. Sir Charles and his followers are overpowered with the vastness of the time required for all this work of “Nature,” for they will have it that “she” is exceedingly slow in all “her” movements. Under this overpowering thought of “her” tardiness, they look at this ancient forest and fancy that if they could only find a stone hatchet, or “chipped flint” among its *debris* what a triumph it would be! Sir Charles says that we need not “despair of one day meeting with the signs of man’s existence” in this ancient wood.

Let it be carefully remembered at this point that if these signs of man's existence in this Cromer forest bed were actually found, it would not follow that his history dates back beyond the time assigned the race in the Bible. We have yet to examine the grounds on which so vast an antiquity is given to what is called the "glacial period," and to see that these grounds are really worthless in sound argument; but all on which we need insist at this point is, that no signs of man's existence have been found in any formation beneath this boulder clay, and so this vast argument of Sir Charles on the glacial period goes for nothing. We shall recur to this formation at Cromer for another purpose by-and-by. It is of no small importance in connection with the upheaval and depression of the land in relation to the sea-level, as well as in connection with other parts of the argument for the antiquity of man.

We must here, however, take up another part of the argument from ice-formations. It is well, as we proceed, to do our best to carry the ordinary reader along with us. Sir Charles Lyell writes chiefly for scientific readers, or for those who have mastered the technicalities of geology, and those also of its kindred sciences; we write for those who have not had the opportunity of doing so. To have a somewhat clear and correct conception both of the theory which has been thought sufficient to explain the formation of "boulder clay," and also of the peculiar soil which is formed by the action of mountain ice, we must look at these substances, so to speak, in their manufacture.

If, then, you imagine a vast mass of ice into

which myriads of pieces of rock have been frozen, and think of this mass sliding down the face, or down the glens, of a lofty mountain, grinding the surface of the rock of which that mountain is composed, and grinding also its own contents, you will easily perceive that the *flour*, so to speak, which is ground in such a *mill*, will make first mud in the water which flows from the glacier, and, when settled anywhere, it will form the very substance which so largely covers Europe, and tells of its icy days. It is seen issuing from the bottom of a glacier like a thick stream of liquid rock showing itself as beyond all mistake capable of forming the finest of clay. This substance may settle in the icy mass itself, and be frozen up with it, or it may flow out from beneath the mass and settle on the surface on which the stream that carries it becomes comparatively still. The muddy substance which is frozen up in the mass of ice will go with that wherever it goes. When the descending stream of ice reaches the sea, and has got beyond the depth at which its weight keeps it to the bottom, so that it floats and is carried off as an iceberg, or ice-island, the mud is carried off in it. When this iceberg, or island, gets into warmer seas, and melts, the mud, with all the stones that have been frozen up in the same mass of ice, falls to the bottom and forms a bed of clay, mixed more or less with gravel and large pieces of rock called "*boulders*." This is one sort, but only one sort, of the class of formations called the "*boulder clay*" or "*till*" of which so much is spoken and written in connexion with the "*glacial period*" of the geologist. This is

the account of it on a theory which is partial in its application to boulder formations, and which is fast yielding its place in science to one of far wider range. When the mass of ice descending the mountain melts before it reaches the sea, or any lake sufficiently large to float it away, the muddy streams that flow from it carry off their mud, with sand or smaller gravel, and deposit what forms beds of clay without "boulders," wherever the flow of the water becomes sufficiently still to admit of such deposition. This finer loam or clay spread over the surface is the "loess" of the German geologists, of which we hear so much, for example, in connexion with the geology of the valley of the Rhine and kindred rivers. The mingled mass of the iceberg, when the frozen water has been separated from it, is the clay or "till" deposit which indicates that the surface on which it lies was under the sea, or some vast lake, when it was laid down. The finer, and less varied bed deposited by running water itself, is the formation which shows simply that the surface on which it lies was overflowed with muddy water when it found its position there. Both are the results of ice action, though the two kinds of deposit indicate very differently as to climate and other conditions prevailing at the time of their formation.

The boulder clay, especially when the masses of rock that are embedded in it belong to distant continents, and could not possibly have reached their present positions by means of land ice, shows that the ground on which it lies was under deep-water when it was deposited. The "loess," on the



other hand, indicates nothing more than that a stream from a glacier had passed over the spot where it is found. Generally it has been believed that the "boulder clay" proves that the ocean overflowed the land where it was laid down at the time of its formation, and in cases where no ice-bearing ocean is now near it has been regarded as telling of a great change of climate, and also of level, that has taken place both on land and sea. The "loess" does not indicate anything of this kind. It is now flowing from the glaciers of the Alps, for example, and being laid down in the valleys below amid the richest luxuriance of the finest of climates. It is consequently one thing to find a relic of the human race in a bed of "loess," and it would be a very different thing to find such relics beneath undoubted "northern drift," which could be proved to have been laid down on the now fertile shores of England by an ice-bearing sea. We shall see the importance of this more fully as we proceed.

This introduces us to the consideration of the only discovery of human remains which Sir Charles ventures to connect with this part of his argument for the great antiquity of man. On the left bank of the Meuse, at the village of Smeermaas, in the Netherlands, there is a bed of "loess" of about twenty feet deep. In a cutting which was made through this clay, between the year 1815 and 1823, when a canal was in progress, a human lower jaw, with teeth, was found. Bones of elephants in extraordinary numbers were found in this cutting, which was altogether about sixty feet deep. The human lower jaw was lying at the

depth of nineteen feet from the surface, in an undisturbed stratum of sandy loam underneath the clay, and above a bed of gravel forty feet deep. So far as we can gather from Sir Charles Lyell's account, the promontory in which the strata occur may be altogether about fifty or sixty feet above the level of the Meuse. They indicate an ancient river course which was changed from being that of a rapid to be that of a sluggish stream, or lake, from some rising obstruction at its outlet, and they point to the removal of that obstruction, and the hollowing out of the valley to its present form, or at least to something near it. The tusk of an elephant of an extinct species, was found some six yards distant from this human jaw, and Sir Charles sees no reason to doubt that the man to whom the jaw belonged lived in the valley of the Meuse, along with this and similar animals. We must remind the reader that we are still confining attention to the formations of material in which human relics have been found. We shall come in due time to consider how much is to be drawn from the fact that men lived on earth with animals that are long since extinct. Our inquiry now is as to the age of the bed in which this human jaw was found. In order to the answer for which this inquiry calls we need not travel, as Sir Charles has done, over all the regions on the face of the earth where glacial mud like this has been laid down. Ice-formed mud, such as that of which the "loess" is composed, is flowing from beneath the glaciers of the Alps at the present day. It has flowed in the same manner from century to century, as the ice has melted, and as

its descending volumes have shortened back into the mountains by the gradually increasing warmth of the climate. These muddy streams have been filling up hollows and covering higher surfaces that have been again scooped out and uncovered as the various barriers have burst by which their flow had been obstructed, and by means of whose obstructions the loess was allowed to accumulate. The fact that a bank fifty or sixty feet deep has been left, and the rest of the strata cut away by the flood, cannot be construed into a proof that this said bank consisted of a formation necessarily even 1000 years old. No one can be ignorant of how soon water washes away sixty feet of loam and gravel, when it has been allowed to cut its way through them. Let us suppose that the valley through which the river Meuse now flows had been at one time so obstructed that the river was converted into a considerable lake at this part of its course. Forty feet of gravel would soon accumulate, if this took place along with a powerful descent of water from the mountains. In the still waters that would by-and-by fill the lower part of the lake twenty feet of mud would soon accumulate. When the barrier damming up the river gave way the stream would very speedily form just such a state of the surface as is found near Maestricht. Sir Charles himself gives an instance from a part of Scotland which seems in point here. He tells us of a barrier that had been 200 feet high, above which a glacial lake had once been confined. The barrier had burst, and the river South Esk, which now flows through it, has cut a passage for itself 800 yards wide. Some

such barriers at the mouth of the valley of the Meuse is all we need think of to account for the strata before us. As we have seen already in a former paper, Sir Charles tells us of streams cutting out ravines sixty feet deep in the mud of the Mississippi Valley in a very few years. What can be the use, then, of telling us of a human jaw found in loam so situated that it might have been deposited, and the stratum in which it lay washed into its present shape in less than half-a-dozen years?

Sir Charles devotes no less than seven chapters of an aggregate of 145 pages, to this glacial affair; but as we go through and through them again, and again and again, we are compelled to feel as if we had to sift mountains of chaff without even so much as one grain of relevant matter being found in the whole. He no doubt has the impression, and other eminent men have the impression, that man has lived on British ground in pre-glacial times, and hence at an era of vast antiquity; but when we ask for facts, instead of groundless fancies, there is not so much as one on which we can fix the eye. If the human jaw found at Smeermaas had lain beneath such clay as ocean-carried ice itself lays down, it might have led to some speculation as to its pre-glacial history, but when it was found only under nineteen feet of such loam as the Alpine streams still send forth, and in such a site as might be formed in a very few years, and that not so long ago, it is really too bad to bring it forward in connexion with the idea that man lived and died in the valley of the Meuse before what is called the

“glacial period” of this part of Europe. The fact that the bones of extinct animals are found in the same formation will tell against *their* vast antiquity, as we shall yet, we trust, be able to show; but it cannot possibly prove the vast antiquity of the human jaw when found in such a situation.

As we proceed with the examination of this argument, and remember that we are canvassing the work of one who has no equal in his peculiar field, we cannot avoid being amazed at the extreme ease with which what are called “the cultivated classes” are drawn away from the grandest of all sources of knowledge for man. The most empty of all conceivable conjecture, coupled with facts that have no real bearing on the issues that are given out as flowing from them, are mixed up and garnished with references to “eminent men” in such a manner as to make an imposing dish. This provision is swallowed with the profoundest relish, and “the bread of life” is set aside and despised! It would be delightful to see the truth as it has been engraven on the rocks, and laid up in the archives of nature, really unveiled to the general view; but when instead of that truth we have palmed upon us the mere spun-out fancies of waking dreams, it is difficult indeed to be patient under the infliction. These fancies are no doubt the product of the most amiable, and excellent, and esteemed among men, but we feel as the banker did when offered the name of a gentleman as a security, and told that he was a truly Christian man—the lover of discounts replied that he had not the slightest doubt of the excellence of character—he only wished that the

good man had command of a little more money. So we have not the least room to suspect the delightful character of these geological speculators—we only wish they had common sense enough to give us a few relevant facts, or to allow it to be understood that they are dealing only in a little dangerous speculation. We must dismiss these arguments drawn from the icebergs and their deposits as we have had to dismiss all the rest, so far as the tombs of human relics are concerned.

## CHAPTER XII.

## THE GLACIAL PERIOD.

THE geological mind is destined, we think, to undergo, if it is not now undergoing, a most important change on the subject of ice-action over the face of Europe. Instead of the idea of a vast ice-bearing sea, rising some thousands of feet above the present level, another view of the glacial period is, if we mistake not, sure to take full hold of the minds of men. It is altogether different from the idea of mere glaciers grinding their way down the glens and into the valleys of snow-clad mountains. Mr Robert Chambers, Professor Agassiz, and especially Mr T. F. Jamieson, of Aberdeen, have done service to the truth on this view. Mr Jamieson, following up his former efforts, in a paper in last year's journal of the Geological Society, describes a state of things in relation to Scotland which affects very deeply the whole argument from ice-action, as that has been wielded to prove the vast antiquity of man. His doctrine is that "the whole country was at one period buried under a thick covering of snow and ice. This rose over the tops of the highest mountains, so as to produce something near to a level surface above all the irregularities of our very uneven land. The highest peaks alone stood above the general uniformity of the outline. It was

not," he says, "in the form of narrow glaciers like those of the Alps that the ice existed at this time, but as a thick cake like that of North Greenland, enveloping both hill and dale, and flowing off not so much on account of the inclination of the bed on which it rested as owing to the internal pressure exerted by the immense accumulation of snow over the whole interior of the island, somewhat in the way that a heap of grain flows off when poured down on the floor of a granary." He rightly says that—"The want of much inclination in the surface of a country, and the absence of great Alpine heights, are objections of no moment to the movement of land ice, *provided we have snow enough.*" \* Mr Jamieson says truly, in opposition to the idea that boulders could be borne even over hills only in floating ice, and, consequently, that they could be laid down only by an overflowing ocean, that if we adopt that theory we must do so on a very large scale. "We require a submergence of 3000 or 3500 feet," to suit the facts—"in short, we require to have the whole of Scotland down below water to the top of all but the highest hills." But he shows that the "boulder clay" or "till" of Scotland has a character that is utterly inconsistent with the idea of its having been laid down in an assorted fashion as it would be in deep water. He says—"Resting on the surface of the ice-worn rocks, we find a wide-spread accumulation of boulder-earth, an unstratified mass of coarse gritty mud, in which are embedded pebbles, boulders, and stony par-

\* See this able paper, "Journal of the Geo. Society for 1865," page 166; &c.



ticles, often of many different kinds, and of all shapes and sizes, from a grain of sand to blocks of considerable weight. These are scattered promiscuously through it, without any regular arrangement. The surfaces of the stones are often scratched and worn like the surface of the subjacent rock; and this is the case with the large boulders and small pebbles, pièces of the size of the finger-nail being well marked if of a fine-grained quality." He remarks that the stones are not scratched on one side only but on all sides, showing that they have been rolled and rubbed along by the masses under which they were moving onwards. He describes the track of boulders all over Scotland, and shows that they have travelled along in vast streams of spreading ice under the pressure of superincumbent snow of vast thickness, instead of having been borne on the tides of an ice-bearing sea. "The boulder mud of Scotland," he says, "I therefore take to be the stuff resulting from the triturating action of the great fields of ice, which overspread the country during the Glacial Period. It lay beneath the ice-crust, and was compressed and pushed along with it, and accordingly its features correspond with this notion." The sea shells and other remains which are found in connection with this formation are satisfactorily accounted for in this same able communication.

This view of the origin of a vast amount of boulder clay makes a most important change in geological ideas as to the land levels of the glacial period, when this sort of "till" was laid down. Sea shells, as they grew, are not found in Scotland at

a higher level above the surface of the sea than 512, or as Sir Charles Lyell gives it, 524 feet, and this is reached only by one case. The highest point gained by any other discovery is only 850 feet. The height to which marine shells give evidence of the submergence of the land in Scandinavia and North America is very nearly the same as in this country. The evidence, therefore, that the sea overflowed the land to the height of 8000, or even of 2000 feet is really wanting. Then, this doctrine of snow and ice action over Scotland applies probably to the whole of Britain, and must not unlikely be yet applied to France, at least in part, as well as to other countries of Europe. Instead of quietly taking for granted that Sir Charles Lyell's immense times of submergence and elevation of continents during what is called the Glacial Period had a real existence, we find them disappearing like the dreams which they truly are and ever have been. Sir Charles does not give up his idea of immense submergence, and holds to it because sea shells are discovered at great heights in Wales, (about 1400 feet,) and the drift in which they are found rises to the height of 2800 feet; but the pressure of snow and ice is proved to be sufficient to carry masses of glacial drift up hill as well as down hill, just as the poured out grain supposed by Mr Jamieson will rise over obstacles that lie in its path, as really as it will roll down inclines that may present themselves on the floor on which it is spreading. Mr Jamieson remarks that, "Agassiz considers the ice to have been a mile thick in some parts of America, and everything," Mr J. says, "that all the evidence

points to a greater thickness in Scandinavia and North Britain." He remarks that "all the facts are in harmony with the notion that the ice was of enormous thickness. Thus the detached mountain of Schihallion, in Perthshire, 3500 feet high, is marked on the top as well as on its flanks—and this not by ice flowing down the sides of the hill itself, but by ice pressing over it from the north." *Let the reader mark that "pressing over" this lofty hill.* "On the top of another isolated hill called Morven, about 3000 feet high, I found granite boulders unlike the rock of the hill, and apparently derived from the mountains to the west. Again, on the highest water-sheds of the Ochils, at altitudes of about 2000 feet, I found this summer (1864) pieces of mica-schist full of garnets, which seem to have come from the Grampians to the north-west, showing that the transporting agents had overflowed even the highest parts of the Ochil ridge." Such is a sample of the facts proving this remarkable transportation by means of land-ice. When we come, as we do in our next chapter, to consider the question of depression and upheaval of the land, as that is argued by Sir Charles Lyell, we shall see more strikingly the importance of the great divergence in view to which this idea of ice-action leads; but even at present we may understand somewhat of the importance of its effect on most weighty parts of our great general subject.

With snow and ice of more than a mile in depth covering the whole of Britain—with this vast mass of frozen matter full, on the under side, and even far up into the mass, of fragments of rock—

and with all this in constant motion over the hills and through the valleys—incalculable quantities of gravel and sand must have been produced as well as masses of clay, with its boulders. The stones affected by the superincumbent snow and ice on such a surface are not only rubbed along on the rock so as to mark that rock and to be marked themselves with stripes that show the direction along which they have been driven—they are also rolled in masses together and rubbed on one another, so as to be made exactly like gravel and sand which have been formed by river action. Especially when collected in hollows over which the massive ice is passing, or enclosed in openings in that ice, immense quantities of this loose material must have been so manufactured as to be easily transported with floods at another period, and so accumulated in river beds, or on the margins of estuaries. When, therefore, Sir Charles Lyell speak of the immense time required to lay down the great masses of gravel and sand in the valley of the Somme, he is overlooking the stupendous operations of this moving ice over the face of Europe. The gravel and sand must first have been manufactured (as we have expressed it,) from the original rocks by this vast ice-mill, and so prepared for the quick and easy transport of the rivers when these began to flow. It was thus carried within reach of the tide for the quick and easy formation of double banks along the shores. Any reader can easily conceive of this process. If you only think of a rocky mountain acted on by frost, which cracks and loosens immense quantities of stone—then covered with immense masses

of snow and ice—the ice next to the rock, and gathering within it all that can be broken off from the parent mountain—this massive and frozen covering being constantly increased above moving in broken order down the face of the hill, continues grinding and rolling its stony contents as it proceeds on its way—then all this reaching hollows in the mountain sides, and reaching also the valleys below, so as to rise up the face of mountains even 2000 and 3000 feet in height, and to go over their summits, the vast gravel stream holding on its way to the nearest or most accessible ocean—think well of the quantities of gravel and sand which this would produce from the rocks in the course of even one year—and you will soon have an idea of what fifty years or a century would do to accumulate beds of this sort of strata. Where then are men's geological dreams of its requiring some hundred thousand years to cover Picardy with the sand and gravel that lies upon it now? And yet it is just upon such excessively wild conjectures that the doctrine of man's vast antiquity is suspended. It is not as if we could get even one tangible or trustworthy fact on which to rest the doctrine. All is the merest and most extravagant speculation. Sir Charles Lyell often admits that it is "very conjectural" reasoning, but reasons on as if it were of such a nature as must sooner or later lead to its own confirmation! Surely it would be more in accordance with true science to adhere rigidly to the truth which has been really established, and even doggedly to refuse to entertain those notions that only mislead the too willingly sceptical mind.

We cannot leave this view of ice-action over Europe without noticing its effect on another part of the argument for the immense antiquity of man. A great deal is made, by the advocates of this antiquity, of the possibility of large animals like the mammoth and of savage men passing from the Continent to the British Isles, so as to commence life in this region. It is held that the channels which now separate the islands from the Continent, and also from each other, must have been dry land when this migration took place. The depth of the Channel between Dover and Calais is less than 200 feet. The entire English Channel has scarcely anywhere a depth of more than 300 feet. If we think of a depth of frozen material covering the whole region, rising to the thickness of even half a mile, and sending out its vast masses into every sea, it will not be difficult to conceive of this channel, at least of its narrower and shallower parts, as filled up with these masses. Sir Charles himself tells of ice-islands that have been met with, floating far from their original stations, showing as much as 225 feet above water, and as much as five miles in length at the sea-level. "Captain Neville ascertained one of them, which he saw floating in the Southern Ocean, to be thirteen miles long and 100 feet high, with walls perfectly vertical."\* Now Sir Charles tells us that the portion of such icebergs below water must be from six to eight times as large as that which is above water. Hence this vast mass seen by the French explorer must have been at least 600 feet deep, and far more than sufficient to have

\* *Elements of Geology*, pp. 145, 146. Ed. 1865.

filled up the channel between France and England itself alone. A few icebergs only the third of this bulk would make a perfect pathway for any size of creature to cross from the Continent to these islands, without any upheaval of the bed of the ocean whatever. "Some icebergs in Baffin's Bay have been stranded on a bottom 1000, or even 1500 feet deep," and consequently where we have proof of sufficient ice-action we do not require to imagine great upheavals to account for the migration of men and animals to those open spots that happened to be suitable for them on the outskirts of a frozen island. An iceberg little more than 30 feet above water would strand itself in the channel between Dover and Calais. A very few such comparatively small bodies would fill up the channel for the time, and supply all that is needed to account for a passage from France to England in a solid pathway of ice or snow. No great time would be required for such an operation, and the bringing about of its more important effects. We have no doubt as to depressions and upheavals of the land, as we shall soon show, but it is unworthy of serious inquiry after truth to overlook those things that abundantly account for certain facts without any vast lapse of centuries, and to make a great deal of such things only as seem to require those extravagant ideas of time. Such reasoning throws doubt over the mind even in reference to the fundamental principles of any science with which they become influentially connected. Sir Charles gives us a series of maps to show how much or how little upheaval it would require to turn nearly all the islands of Europe

into parts of the Continent, and how much or how little depression it would require to turn these insular countries in which we live into small islets peeping out of the ocean. He is bent on connecting these changes of land with man's vast antiquity, and the vast antiquity of the prevalence of certain mammalia along with which men lived in Britain, when all that is needed to account for the presence of these creatures on our island may be found in changes requiring far more limited periods than those which he imagines necessary for his favourite alternations of level.

But this leads us naturally on to another part of our subject.



## CHAPTER XIII.

## UPHEAVAL AND SUBSIDENCE.

Nothing is more certain in geology than that land which once formed the bed of the ocean is now above the level of its waters. The gravelly and sandy strata originally covered with salt water, on, and in which, myriads of marine creatures lived and died, are seen forming portions of lofty hills hundreds of feet above the positions in which they must have been formed. The gravelly masses in the valley of the Somme to which so much attention has been directed, have undoubtedly been raised above the level at which they were formed, when the flint tools of ancient men were mixed with the other materials of which these masses are composed. Whatever difference of opinion may exist among the well-informed as to the power by which land is thus uplifted, or as to the time required for the process by which the upheaval is accomplished, there can be none as to the fact of elevation itself. Nor can there well be any doubt that the remains of human beings and of their works, which have been imbedded in river strata, are now found in that strata above the level of the rivers in which they were collected. The flint implements found in the higher parts of the valley of the Somme must have been originally let fall among the gravel in which they are

now found when that was more than fifty feet lower in relation to the river than it is now. The whole valley must have been raised above the surface of the river, to that extent at least, since men first lived on the shores of the estuary with which it was so far filled. But this raising of the land is associated with a raising and lowering of the bed of the sea, and with the subsidence of other parts of that dry land itself. So there can be as little doubt that certain parts which were once dry and covered with forests and the abodes of men, are now beneath the waters of the ocean. Just as certainly as peat grows on the surface, and mud is accumulated, and gravel and sand are laid down, so do portions of the surface on which all this is going forward rise above and fall below the great sea level of the globe. This rising and falling is a matter of time, and hence it comes in upon us in our inquiries as to the age of man on the earth. A very great deal is made of the vast periods required for changes of level in the land and ocean in Sir Charles's Lyell's reasoning on the antiquity of man. It is well for truth that he may be most satisfactorily followed up in this as in other portions of his work. He furnishes us in a great measure with the means of this in his own statements of fact, though we are much more abundantly furnished in the records of change which are so constantly required to mark the singular progress of geology.

In order to a clear understanding of the argument for the vast antiquity of man, as that is derived from the rising and sinking of portions of the earth's surface, we must keep two things care-

fully in view. The first of these is the ignorance in which all are equally involved as to the nature of the forces by which the upheavals and subsidences that have taken place have been effected. The second is our ignorance of the degree to which these forces are acting now as related to the degree in which they were active in bygone times. No one can be acquainted with the present state of geological science without being aware that, so far as the true character of the interior of the earth is concerned, men are as yet profoundly ignorant. A very striking instance of this ignorance is opening itself up to view in the change which is passing over the geological mind as to the origin of granite. Sir Charles Lyell himself is entirely at sea on this point. In his last publication he clings to the idea that granite is somehow of igneous origin, but he cannot tell whether it has been produced by "slow cooling under great pressure," (which was his full conviction not long ago,) or by "vapour," or how. The truth is that his favourite view of molten rock crystalizing at vast depths, and under great pressure, is vanishing from the minds of scientific men, and another idea altogether different is taking its place. If we do not greatly mistake the right conclusion to which late discoveries tend, granite will be found to be originally sedimentary rock merely changed in mineral structure by the chemical action of water, totally apart from all influence of fire, either above ground or below. There can be little real room for doubt that ordinary and stratified rocks are now in the course of transformation into granite, just as metals are in

course of deposition in rocky veins, and that by means of rain water sinking from the surface, dissolving the rocks, and laying down from the solution those wonderful products which fire alone has been deemed adequate to create. There is no melting—no boiling—no vapouring—no violence, or terribly explosive, or earth-shaking agency in the case—nothing but the mighty power of dissolution and deposition which is exerted through water as it descends from the clouds. This takes hold of the rocks which are chemically fit to be transformed into granite—avoids these lime-strata not fit for such a change—but so changes those rocks on which it fastens as utterly to confound the man of “platonic” notions, by showing him granite and limestone (with the remains of life in it,) laid layer on layer, one interchanging with the other, in (to him) the most inexplicable harmony. The change which is passing over geology in the matter of granite is affecting it in reference to all the crystalline rocks which, since they have been hitherto regarded as “primitive” and “fundamental,” but must now be put down as on a level with the rest, so far as their origin is concerned, present a most serious puzzle to the scientific mind. The heating and cooling of these rocks, which was Sir Charles Lyell’s favourite idea of the force which caused the upheaval and subsidence of land, must be entirely abandoned, along with his theory of their manufacture. He must now go elsewhere than to the granite for explanations of his favourite alternations of level.

There is another point of very great moment in connection with this—of upheaval and subsidence

of the land on which a great change has passed over geology. We refer to the origin of mountain chains as the result of the sinking of the bed of the sea rather than that of some fiery and tremendous force uplifting the land. The editor of the Geological Magazine, in his January number of last year, says—"We have learnt of late that, in accordance with the general structure of the globe, continental areas may be regarded as portions of the earth's crust, crumpled at their edges by the lateral pressure affected by the sea-areas being dragged downward by contraction; and that this crumpling has produced elevated ridges or mountains, together with changes in the strata; limestones becoming marble, coal being purified into anthracite and graphite, and, may be, diamond; sands changed to quartzites; clays and muds to slates and schists; nay even gneiss and granite coming out from the further process of heat and squeeze and change of moist strata; the former structure lost, but the original elements still remaining; the silicia and alumina, and their associated alkalies, metals, and so forth being rearranged in crystalline and often gem-like forms." Again he says—"Many a range of so-called primeval granite, gneiss, and slate lapping one over the other successively for hundred of thousands of feet, or of upright 'primary schistus,' miles across, will exhibit to the geologist of to-day only many times repeated folds of an altered set of strata; nor will their furthest change, or granitic form be taken either for primeval or obtrusive granite; and, while the latter may still be found, the former, or the hypothetical granite of a cooling

globe, becomes a myth." Now this very "myth" is Sir Charles Lyell's grand idea for the explanation of the upheaval and subsidence of the terrestrial surface. He says—"It is ascertained that solid rocks, such as granite and sandstone, expand and contract annually, even under such a moderate range of temperature as that of a Canadian winter and summer. If the heat should go on increasing through a thickness, say only of ten miles of the earth's crust, the gradual upheaval of the incumbent mass may amount to many hundreds of feet, and the elevation may be carried still further by the complete fusion of part of the inferior rocks." Sir Charles then notes that granite, in passing from a melted to a solid state, contracts more than ten per cent. "So," he says, we have at our command a source of depression on a grand scale, at every period when granitic rocks have originated in the interior of the earth's crust."\* But this hypothesis which Sir Charles has "at command" is only one of the evanescent conjectures on which nearly his whole reasoning is based! It is, in fact, a "myth." He imagines a melting and a refrigerating process going on beneath the surface at a rate that is solemnly slow, and thus he sees the elevation and depression of coastlines during incalculable centuries, or ages, all clear from bottom to top most beautifully, only it is all in dreamland. The steady and cautious progress of true science, meanwhile, is taking up the whole fabric of his vision, and proving that it is a fancy and nothing more. As granite and its kindred rocks are now found there is not the

\* *Antiquity of Man*, page 286.

shadow of a reason for thinking that they were ever heated at all. They have been produced by the merely chemical change which alters the character of ordinary rock without disturbing it in any way as a mass, so as to affect the position of its surroundings. There is such a thing as volcanic fire and molten rock, but these have no relationship of paternity to those "fundamental" strata that were imagined to be thrown up from the bosom of the globe so as to produce even our loftiest mountain chains. The scientific mind must continue its search for the causes of elevation and depression. They are not yet found.

Since such is our position in relation to the forces by which the great changes of level in the surface of the earth are effected, it is not wonderful that we should also be ignorant of the degree to which the hidden power has been exerted in bygone times, as compared with the degree of its exertions now. If we could truthfully assume that the rate of upheaval and subsidence is now the same as it ever has been, we might, perhaps, learn a good deal of the chronology of past changes, from observing with sufficient care the changes of the present. But such an assumption signally stultifies itself, as we shall by-and-by see. Those changes of level with which we are best acquainted indicate, as we think, a cavernous character of the earth. There must be vast spaces into which whole islands sink down, and vast spaces from which such islands have so often been raised. But that no change is going on in the capacity of this internal system, or that no alteration is taking place in its rate of change, is an assumption con-

trary to the progressive character of all material things. This will, however, more fully appear as we go on with this part of our subject.

There is an argument so far, in the alterations of level on the earth's surface, for man's antiquity as an inhabitant of this world. Sir Charles Lyell has seized on this argument, but with that extreme looseness of logical grasp which so remarkably characterizes his whole work on this subject of the age of our race. He has not taken the valley of the Somme as his chief point for this part of his reasoning. A more striking instance of the upheaval of human relics is found for this purpose. "Count Alberto de la Marmora, in his description of the geology of Sardinia, has shown that on the southern coast of that island, at Cagliari, and in the neighbourhood, an ancient bed of the sea, containing marine shells of living species, and numerous fragments of antique pottery, has been elevated to the height of from seventy to ninety-eight metres [that is from about 230 to 320 feet] above the present level of the Mediterranean. Besides pieces of coarse pottery, a flattened ball of baked earthenware with a hole through its axis, was found in the midst of marine shells. It is supposed to have been used for weighting a fishing net."\* Here then is a "rise of the bed of the sea to the height of 300 feet, in the human period, in Sardinia." We shall soon see what use Sir Charles makes of this fact.

There is now going on an upward movement of the land on the coasts of Norway and Sweden, "extending throughout an area of about 1000

\* *Antiquity of Man*, p. 177.



miles north and south, and for an unknown distance east and west, the amount of elevation always increasing as we proceed towards the North Cape, where it is said to equal five feet in a century." From this Sir Charles assumes an average rate, for the upheaval of land, of two and a half feet in each hundred years. He makes this utterly gratuitous guess a standard of measure, not only for the Scandinavian land over which he assumes it, but for the Italian island of Sardinia, and indeed for all other lands. So he says—"If we assume the average rate of upheaval to have been, as before hinted, (p. 58,) two and a half feet in a century, 300 feet would give an antiquity of 12,000 years to the Cagliari pottery, even if we confine our estimate to the upheaval above the sea level." Again he says—"Even then our calculation would merely embrace the period during which the upward movement was going on; and we can form at present no conjecture as to the probable era of its commencement or termination." The young lively imagination has here pictured for its use a full view of potters at their wheels, untold thousands of years before the Bible teaches us that man was on the earth at all. But can anything be more melancholy than the utterly fallacious reasoning by which the fancy is supported? Let us look into it with the greatest care.

In his volume on the "Principles of Geology," Sir Charles tells of the elevation of marine strata round the island of Santa Maria on the coast of Chili, on the authority of Captain Fitz Roy, in the following terms. The earthquake of 1835 in that region occurred in the early part of the year.

In the beginning of April Captain Fitz Roy said "that the southern extremity of the island had been raised eight feet, the middle nine, and the northern end ten feet. On the steep rocks where vertical measures could be correctly taken, beds of dead mussels were found ten feet above high-water mark. One foot lower than the highest bed of mussels, a few limpets and chitons were seen adhering to the rock where they had grown. Two feet lower than the same, dead mussels, chitons, and limpets were abundant." Here then, beyond all question, is an instance of the upheaval of land, and a very striking one too. Sir Charles goes north to Scandinavia to get a scale of two and a half feet of a rise in a century—how should he not go in another direction to get a scale of at least nine feet of elevation in the space, probably, of a few hours? But this is not all.

It is to us somewhat wonderful that he does not couple two Scandinavian arguments on this very point. He tells us (page 240) of an instance of subsidence and upheaval of land south of Stockholm, which seems remarkably to his purpose. He gave it in the *Philosophical Transactions* for 1895. In 1819 a section was there laid open, which showed that a subsidence, followed by a re-elevation of land, each movement amounting to more than sixty feet, had occurred since a rude hut had been built on the ancient shore. The wooden frame of the hut, with a ring of hearth-stones on the floor, and much charcoal were found, and over them marine strata more than sixty feet thick, containing mussels and other brackish water shells of the Bothnian Gulf. Some vessels put

together with wooden pegs were also found. This hut had been lowered by subsidence of the shore till above sixty feet of sea-water stood over it, and again raised till it was fairly above the surface of the gulf. Assuming the average of two-and-a-half feet in a century for the subsidence, and also for the re-elevation, here was something like 5000 years for the age of this ancient dwelling. This would be putting Scandinavian things at least together, instead of picking up a guess on the coast of Norway, and rushing off to the Mediterranean to apply it to a fact there. The guess would still be merely a guess, but it would have an increased degree of plausibility. Only the 5000 years would not have the effect on the imagination which 12,000 have. It would not seriously affect the 7000 of Bible chronology, so Sir Charles has let it pass, and has fixed on Cagliari.

But his inconsistency is constant. He has found his 800 feet rise in Sardinia, and goes for his scale by which to measure it to Scandinavia. He might have got his scale in Italy. In this same volume, as well as in his "Principles," he furnishes us with many striking instances of elevation and subsidence of land in Italy. He says—"I have adduced the strata near Naples, in which the Temple of Serapis at Pozzuoli was entombed. These upraised strata, the highest of which are about twenty-five feet above the level of the sea, form a terrace skirting the eastern shore of the Bay of Baïæ. They consist partly of clay, partly of volcanic matter, and contain fragments of sculpture, pottery, and the remains of buildings, together with great numbers of shells, retaining

in part their colour, and of the same species as those now inhabiting the neighbouring sea. Their emergence can be proved to have taken place since the beginning of the sixteenth century.\* Here is the Italian coast and an elevation of twenty-five feet, if we judge by the Chilian upheaval, probably in a single night, instead of two and a half feet in a century on the Scandinavian shore. Why should so distant a quarter be gone to for a scale when there is so excellent an instance just at hand? The force which could raise the bed of the sea twenty-five feet above high-water mark at once, could surely raise it three hundred feet in less than 12,000 years. How can we characterise the reasoning by which such a monstrous conjecture as this of Sir Charles is rendered possible in serious print?

To meet all such reasoning as this, Sir Charles says, "I am aware that it may be objected that the average rate here proposed is a purely arbitrary and conjectural one, because at the North Cape there has been a rise of about six feet in a century, and at Spitzbergen, according to Mr Lamont, a still faster upheaval during the last 400 years. But granting that in these and some exceptional cases (none of them as yet very well established) the rising and sinking has for a time been accelerated, I do not believe the average rate of motion to exceed that above proposed. Mr Darwin, I find, considers that such a mean rate of upheaval would be as high as we could assume for the west coast of South America, where we have more evidence of sudden change of level than

\* *Antiquity of Man*, p. 45.

anywhere else." So we have the impressions of Mr Darwin and Sir Charles Lyell as the sum total of support for this vital point in their vast conjecturings! As speculators they are about the last men that ever put pen to paper to be trusted in their speculations, and their mere *belief*—that is their vague fancy—is the last thing in the world to be assumed as a scale with which to measure any reality.

We are not yet come to that part of our inquiry in which we shall have to consider the argument derived from species of animals that have become extinct in the regions which they once inhabited, but we may at our present point, notice the similarity in this respect of the strata at Cagliari, to that at Pozzuoli. The marine shells in both are of species now living in the neighbouring sea. At Cagliari "the mussels are often in such numbers as to impart, when they have decomposed, a violet colour to the marine stratum." We have seen that the shells in the stratum at Pozzuoli retain "in part their colour also." So far as these two formations themselves are concerned there is nothing but the greater height of that at Cagliari to indicate that it is anything like so much as 10,000 years older than that at Pozzuoli.

Sir Charles has recourse to an argument found in the fissures of the rocks around Cagliari, in which there is what he calls "a bone breccia," containing the bones of extinct species of land animals. Embedded in this same breccia, and enveloped with red earth like the other remains, mussel shells are found similar to those obtained from the 800 feet upheaved strata. He holds

that these must have been washed from that strata into these rents, so that they prove the land to have been upheaved before the time when these now extinct animals inhabited that part of the world. From the fact of the pottery being found on the raised land he thus argues that man must have lived with these extinct animals more than 12,000 years ago. This reasoning is like all the rest in the volume. If we accept as facts, what Sir Charles states as such, we reach this conclusion only—that there were some remains of animals now extinct that had got somehow mixed with the mussel shells in this gravelly formation, and were washed along with these shells into the fissures spoken of. This is no more an evidence that these now extinct animals lived and grazed, or wandered over that formation, than that they lived in the fissures in which their bones are now found. Let us suppose that these fissures were hereafter emptied of their contents, and that these were so strewed along the shore as to mingle with a new mass of gravel in the course of accumulation. The bones and the mussel shells would then be found together in that formation, and we should know that they were formerly mingled in the fissures of the rocks from which both had come; but would that prove that they grew together in the rocks? If not, how can the fact, if it be a fact, that these bones and mussel shells were mingled on the raised bed of marine formation prove that the creatures whose bones they are, lived along with men, and roamed over that bed after it had been raised?

When the very highest interests of humanity

are being seriously affected, we surely have reason to look for a mode of argument totally different from this. Instead of the wildest conjecture, supported by the most one-sided statements of fact, we should expect to see every item of apparent evidence put to the severest test, and set aside thoroughly when seen to be unsound. But we have, as we have shown over and over again, the most unfounded fancies solemnly paraded as worthy of scientific thought, and nothing but what seems to favour them seriously taken into consideration. Yet on no better ground than that which this sort of reasoning supplies, the President of the British Association said at Newcastle—"It seems no longer possible to doubt that the human race has existed on earth, in a barbarous state, for a period far exceeding the historical record." Sir Charles Lyell, no doubt, repeatedly speaks of his chronological scales as merely conjectural and tentative; but the effect of his guesses even on minds in many respects eminent, is to induce *belief*—not merely imaginings—but belief that does not admit the possibility of a "doubt." The effect on inferior minds, and on the young and inexperienced, is disastrous. They are led to treat the whole Scripture record as little better than a dream, and so to allow themselves to be inflated with a vanity that sooner or later gives way to despair amid the terrible discoveries of stern and eternal reality.

## CHAPTER XIV.

## DEPOSITS IN CAVERNS.

A GREAT reward is sure to be reaped in the end by the really careful inquirer after solid truth. If he accepts gratefully that which lies on the surface, or within very easy reach, and then goes on to dig for that which must be sought for as "hid treasure," the result will abundantly compensate for any amount of patience and earnest toil. In order to this result, however, he must sacredly avoid the danger of mistaking mere impressions, or conjectures, for truth. He must keep, with the sternest rigidity of purpose, to the adamantine pathway of actual knowledge, and find his way, however slowly, along that pathway alone. He must see to it that his facts are facts indeed, and also that his reasonings are the soundest logic. It is on this principle that we proceed so gradually in our investigation of the geological argument in relation to the antiquity of man. We must not yet consider those mixtures of the bones and other relics of men with those of extinct species of animals, which are found imbedded in the rocky accumulations that have been gathered in the caves of the earth. It is necessary first to look at the evidences which have a bearing on the age of those rocky deposits in which the mixture has taken place. We have as yet eschewed all argument



derived from the character of the objects found in the various formations which we have studied, that we might sift effectually those reasonings which are founded on the slowness of growth in the accumulation of the beds in which these objects are found. We take the same slow but safe course with the gravelly deposits which are found in caverns, to the examination of which we have now come. Have we reason to believe that these deposits themselves are so ancient that the bones and other relics found in them must have belonged to men and other animals inhabiting the earth more than 7000 years from the present time? Every careful thinker will see at once the importance of this inquiry. If we can satisfactorily show that the beds in which the relics are now found are of comparatively modern date, it will go far to settle the question as to the antiquity of the relics which are so found. We are quite aware that the relics might be of such a character as to show that the beds in which they lie are immensely ancient, but our examination of that aspect of the argument comes naturally after an inquiry into the age of the beds themselves. To this aspect, therefore, we address ourselves now.

The caverns of the earth are much more extensive than the cursory reader may be prepared to believe. We are so accustomed to speak of the solid rock, and to think of all as one compact mass beneath us, that the most scientific are, for a time, confounded when the deflection of the plumb line itself indicates that vast vacuities exist underground. There is now going on a most

expensive survey, the object of which is to account, if possible, for the fact that over a large territory the plummet fails to indicate a true perpendicular. So far as the investigation has gone it seems to tell of an immense vacuum beneath the territory in question—an abyss so vast that the sides of it attract the metal of the plummet while the attraction of the bottom fails to keep the line in the direction of the earth's centre. The plummet may no doubt be slightly drawn from the perpendicular by some other means than that which is thus indicated, but its deflection in this case seems strongly to point in the direction of some such vacant space as that which is supposed. Whatever may be the truth in relation to this matter, it is beyond all question that there are great empty spaces in the masses of rock that form the crust of the earth. Sir Charles Lyell tells us that "in the limestone of Kentucky, in the basin of the Green River, one of the tributaries of the Ohio, a line of underground cavities has been traced in one direction for a distance of ten miles without any termination, and one of the chambers, of which there are many, is no less than ten acres in area, and 150 feet in its greatest height." This fact gives a very extended idea of the field of inquiry opened to view when we enter the caves of the earth to search for the relics of ancient men; for although this Kentuckian system of caverns is on a gigantic scale, there are somewhat similar systems all over the surface of the world. Rain water, charged as it is with carbonic acid, dissolves the limestone rock, and carries it off in solution. Wherever this water is allowed to enter and to

pass through such rock, therefore, openings are soon widened, and as the process goes on vast caverns are formed.

Here, however, it is to be carefully marked that it is not with the construction of these caverns that we have to do in our present inquiry. How they were originally formed is not yet well known, nor does it affect the question in hand to learn as to when they were opened in the rocky masses in which they are found. It is with the mud, gravel, and similar materials accumulated on their floors, and with these alone we are called upon to deal. In many cases these chains of cavernous openings are so situated that rivers pass through them, as through natural tunnels, for many miles. Large rents in their rocky roofs pass upwards also to the surface above them, and allow all sorts of objects from the outer world to descend and accumulate beneath. Lakes too of considerable size are formed in cavernous chambers in the heart of mountains, forming the unfailing sources of perennial springs of the most delightful water, from its being so effectually filtered on its way to the surface through which it wells up at lower levels. It is with the deposits that have been left in those subterranean beds of rivers and lakes, during the time when men inhabited the earth, that the geological inquirer after the age of our race must carefully deal, for it is only in these accumulations within the caves that relics of men are found. No trace of our ancestors appear in the rock of which the roofs, and walls, and proper floors of the caverns are formed. Mud from the water, small gravelly fragments of the rocks mix-

ing with that mud, accumulations of dissolved limestone, of which these rocks are generally composed, cementing the muddy, gravelly mass in a compact body—this is the “*breccia*,” or conglomerated deposit, in which bones and other relics of man are found. It is as to the antiquity of this that we have now to inquire. The reader may easily comprehend that which is thus before us. You enter, for example, one of these caverns, and it may be at first your attention is arrested by its spacious area or by the character of its roof, and you conjecture how it was ever opened and dug out of the solid rock in which it is situated. At length you find that since that took place a strangely mingled mass of stony rubbish has gathered on the floor, and you learn that in this some relics of human beings have been found. You may well enough inquire as to how long it is since that rubbish was laid on that floor. In so far as you can reply you will have some idea of how long it is since men lived in the country in which this cave is found.

It is well, then, to look somewhat at the way in which these rubbishy accumulations make their way into such caves, and it is not difficult to understand. For example, Sir Charles Lyell himself furnishes us with striking instances of cavernous systems now receiving their contents conveyed into them by water from year to year. He says—speaking of the Morea—“In the more elevated districts of that peninsula there are many deep, land-locked valleys, or basins, closed round on all sides by mountains of fissured and cavernous limestone. The year is divided, almost as

distinctly as between the tropics, into a rainy season which lasts four months, and a season of drought of nearly eight months' duration. When the torrents are swollen by the rains, they rush from the surrounding heights into the enclosed basins; but instead of giving rise to lakes, as would be the case in most other countries, they are received into gulfs, or chasms, called by the Greeks 'Katavothra,' and which correspond with what are called 'swallow-holes' in the North of England." The substances that are carried into "swallow-holes," and deposited along the floors of the tunnels to which they lead at the present day, are similar to those cave deposits in which bones of ancient men and animals are found, which are conjectured to be of such age as to set all Bible ideas of the antiquity of the human race for ever aside. The bones of men and other animals with the remains of plants can now be seen in the mouths and along the beds of these underground rivers in the course of accumulation, as they were gathered of old in those caverns that have long ceased to be traversed with streams of any consequence, or which are nearly or altogether dry. The rivers enter the caverns with their muddy burden, carrying all that can be floated or rolled along with them, and they issue from the further ends of these natural tunnels perfectly clear, leaving all that has entered with them to accumulate on the floor of the passage along which they have come.

There is one thing, however, to be noticed as a sort of transition process in the formation of these cavern deposits. That is, the dripping of water,

carrying in it a solution of the lime of the rock through which it percolates, and falling on the deposits which lie on the floor of the cave when the river has ceased to flow over them. This lime water parts from its lime so as to leave that for a firm cement of the loose masses on which it has fallen, and to form also, in course of time, a rocky floor above them. This is the "*stalagmite*" of the geologist, the gradually accumulating carbonate of lime, something like that which gathers on the bottom and sides of a tea kettle in which "hard water," or water having lime in it, is often boiled. This cementing and floor-making process is going on in caves through which streams have ceased to flow with force at the present day. So far as the gathering of materials and the cementing of these into a solid rocky mass are concerned, we have the very same processes by which the most ancient of the caves of the earth were furnished with what geologists call "bone breccia," at present in actual progress. So far as these processes are concerned, therefore, we may safely affirm that it would be utterly absurd to claim for any relic that has been discovered in them anything like a period of half the age of mankind according to the Bible chronology.

But this brings us to Sir Charles Lyell's great argument for a vast antiquity to the human race, drawn from the formation of the gravelly deposits in the cavern. The caves on which he chiefly relies for this part of his reasoning, have ceased, as he thinks, to be within the reach of rivers such as could flow through them, and such as must have flowed through them when the deposits on

their floors were formed. He speaks of "the great number of centuries necessary for the conversion of the physical geography of the Liege district from its ancient to its present configuration; so many old underground channels, through which brooks and rivers flowed in the cave period being now laid dry and choked up." His words—(we must remark in passing)—are here somewhat strange. It is not difficult to see what he means by "the cave period," but it is difficult to see why he should use such language to express what he means. He says "there are now in the valley of the Meuse, not far from Liege, several examples of engulfed brooks and rivers," and he goes on to describe the process of filling up the caves through which those brooks and rivers pass, as at present going on. It is very clear, therefore, that we live as truly in "the cave period" as did those men whose relics are now dug up along with those of extinct animals. "Underground channels" are now being filled up with deposit. Caves through which brooks and rivers flowed only a very few years ago, are now laid dry and choked up. In the strongest sense the words can bear, we must hold that we live in "the cave period" ourselves. There is great delusion in this way of giving a designation to an imaginary epoch such as makes the careless reader set it down as something very definite and distant, when, in fact, the very same features which belong to it, characterise the present hour. For example, Sir Charles tells us that, "during the great earthquake in 1693 in Sicily, several thousand people were at once entombed in the ruins of caverns in limestone at

Sortino Vecchio ; and at the same time a large stream which had issued for ages from one of the grottos below that town, changed suddenly its subterranean course, and came out from the mouth of a cave lower down the valley, where no water had previously flowed. 'To this new point the ancient water mills were transferred.'\* In 1698 then, at Sortino Vecchio, underground channels through which brooks and rivers had flowed were laid dry and choked up. So, if we are to follow the current of Sir Charles's wonderful reasoning to its legitimate issue we must, after all, conclude that "the cave period" was then wound up in a week or so, and more modern times began ! In the theory, "great numbers of centuries" are deemed necessary for underground channels to become dry and choked up, and yet in the facts such channels become dry and choked up "suddenly." How can such reasoning lead to truth ?

But Sir Charles goes on to say that "the great alterations which have taken place in the valley of the Meuse and some of its tributaries, are often demonstrated by the abrupt manner in which the mouths of fossiliferous caverns open in the face of perpendicular precipices 200 feet or more in height above the present stream." What does he mean to prove by this elevation ? If it could be shown to be impossible for a stream to issue from the mouth of a cavern and to fall (even 200 feet) into the river below, his statement might have some force. Or if he were speaking of that end of the subterranean passage at which a stream *entered*, we might understand him. If *that* were 200 feet

\* Principles of Geology, page 708, 7th edition.



above the streams that once flowed through the tunnel, we might have a fact of some meaning in the case with which to deal; but it is only the opening out of which the water flowed which is, and, beyond doubt, may always have been 200 feet above the level of the river into which it fell! Was ever reasoning more wild or regardless of everything like cohesion?

Sir Charles, however, has other matters to state on this point. He speaks of caverns in the opposite sides of the valleys, leading to the "*suspicion*" that they formed parts of continuous tunnels before the existing valleys were scooped out. In a limestone gorge it would be wonderful indeed if caverns and underground channels did not open out on both sides of the gully. Streams from these would fall into both sides of the stream below. But to what sort of an imagination will this natural fact suggest the idea that the opposite mouths of these channels were ever parts of continuous tunnels that crossed the gorge? We shall not say.

Sir Charles finds himself at this point in danger of foundering in the fancied depths of change which he himself has created. The scooping out of the valley, for which he has no adequate force in view, is a matter of *too much time* for even his notion. But he gets over the difficulty by saying—"It is more than probable that the rate of change was once far more active than it is now." This is nothing but playing "*fast and loose*" with a subject involving the highest possible interests of man. We are not told that these caverns which lie 200 feet above the bed of the Meuse

contain any relics of man. All reference to them is consequently irrelevant to Sir Charles's argument. We have no sort of connexion traced between any of the caves in which human relics are found, and such degrees of elevation above the beds of existing rivers, till we come to some caves on the shores of Italy. Here we meet with a most ineffectual attempt at something like an argument. It can scarcely be said that it takes tangible form.

On the shores of the Bay of Palermo, in Sicily, there are a number of caves in the limestone rock. Sir Charles fixes upon one of these "about a mile from the shore, and one hundred and eighty feet above it."\* It is the cave of San Ciro. In the bottom of this there is found "sand with marine shells." This fact would prove apparently that the sea once flowed into the mouth of the cave. But let the reader mark well what follows. "Higher in position, and resting on the sand is a breccia . . . through which land shells are dispersed together with bones of two species of hippopotamus." With these bones are associated those of other ancient and now extinct mammalia. No remains of men have been found in this cave, and so we might pass it over. But Sir Charles speaks of another cave similar in position to this one, in which relics of the human race have been found. It may, therefore, be as well to look into the argument which is derived from the cave of San Ciro. Let us, then, allow that the sea flowed into this cave, and laid down sand and marine shells on its floor. The land then rose 180 feet

\* Antiquity of Man, page 175.

above the sea level. What took place then? Sir Charles tells us that the materials of the breccia laid on the sand were "evidently washed in from above through crevices in the limestone." "Flint knives, bone splinters, bits of charcoal, burnt clay," &c., were found in the upper portions of what had thus been washed into the cave by the floods upon the land above. And what can all this prove as to the age of these cavern deposits? There is no upheaval of the land required to account for their position, though it is required to account for that of the sea shells beneath them. Sir Charles immediately introduces the 800 feet of rise in Sardinia, as if it had some connection with these caves, but there is no evidence of rise needed in connection with them. Streams of water have ceased to flow through them, just as they are ceasing to flow in certain other caves by means of earthquakes and such changes as are now affecting the surface of the earth.

Even if we had a rise of 180 feet above the level at which these caves stood when fresh water alone flowed through them, and if that rise were as gradual as that of the shores of the Frith of Forth now going on, the result would amount to nothing in Sir Charles Lyell's argument. Mr Thomas Smyth, of Edinburgh, has, we think, shown satisfactorily that these shores are rising at the rate of five feet in a century. This would give only 8600 years for 180 feet. But, as we have already fully shown, all such reasoning from one shore to another is fallacious; and here there is no use for anything of the kind. The strata in which relics of men are found are accounted

for, and that perfectly without any rise in the land at all. They may have been laid down last century for anything that their geological position can tell. Their contents in other respects indicate a much greater age, but we have these other respects yet to examine. So far as the so-called geographical alterations are concerned, Sir Charles has really no argument from these caves whatever, nor has he any more argument from any others of the kind. The scooping out of valleys across which tunnels once ran, and on either side of which those tunnels now show their mouths—the upheaval of shores on which caverns lie, upheaved far above the sea level since men were on the earth—all are realities in the imagination only. The reasoning which is founded on such pure fancies is worthless—worse than worthless. So far as such reasoning is concerned we are left without star, or chart, or compass in the wilderness of conjecture, with nothing to guide us but the mere vague impressions of a geological but most illogical mind. The “great alterations” in physical geography, which are to demonstrate the great age of the caves, when we sift the evidence educed in favour of them, so far as they affect the age of man, come really to nothing. The very alterations which change a system of caverns from being the bed of a running stream to be the comparatively dry bed of a fossiliferous deposit, as we have seen, occur in a week or even in a day, as the effect of an earthquake, and cannot possibly indicate anything as to the age of the relics they enclose.

Sir Charles mixes up constantly a great variety

of arguments, and clearly makes a great deal of the presence of extinct species of animals with man on the earth; but it is utterly vain to try to arrive at a satisfactory conclusion by such a mode of reasoning on any subject. Ten thousand arguments, each of which fails to stand on its own feet, come all to nothing with a careful reasoner, when huddled together just as when placed each alone. It is on this account that we have been led to deal with each position of this argument separately, so as to see how absolutely worthless they all are. Instead of evidence upsetting the authority of sacred Scripture, and proving that man has been an inhabitant of the earth some 500,000 years, we have presented for our acceptance a congeries of conjectures and impressions totally void of all force or coherence whatever. We shall now have to examine a thoroughly different class of facts and arguments, but so far as we have to deal with the time required for the growth of strata in which relics of man have been found, we must hold that 7000 years are far more than sufficient to account for the whole.

## CHAPTER XV.

## THE ARGUMENT FROM TREES.

WE have now reached that point in our discussion at which we naturally enter on the consideration of those relics of an ancient world which are found buried in the strata to which we have been hitherto confining attention. The careful thinker will have no difficulty in perceiving the very great importance of noticing the effect which the two grand branches of this geological argument have on each other. The failure in attempting to prove the vast antiquity of the beds in which the relics of men have been found is to a very great extent a failure in attempting to prove the vast antiquity of the relics thus found. It is, indeed, a total failure of one great aspect of the argument which Sir Charles Lyell has conducted. But it is not the entire failure of that argument. Another aspect remains to be tested. The vast antiquity of the relics might prove the vast antiquity of the beds in which they lie. If, for example, it could be proved that no mammoth lived in Europe during the last 7000 years, and yet the bones of the mammoth are found as laid down by the dying beast in a certain bed of sand, then that bed of sand would be proven to be more than 7000 years old. Then, also, since the relics of men are found along with the mammoth bones in that

bed of sand, it would be shown that man lived in Europe more than 7000 years before our day. Sir Charles Lyell places the greatest stress on this aspect of his argument, though it is every whit as frail as that aspect on which we have hitherto been engaged. Consequently we must give it our best consideration.

From the course which we have pursued in passing from the recent formations of peat to those which have been regarded as the oldest formations on the earth, we come first upon such relics of ancient times as are found imbedded in mosses such as those on which Sir Charles has dwelt most fully. The relics which meet us at the very outset when following this line of thought are the remains of ancient trees. When endeavouring to form some correct idea of the time during which man has been on the earth, we cannot reasonably avoid the consideration of those ancient forests which lie buried on its surface, and among the remains of which relics of our race have been found.

A very common plan in the plantation of trees on estates of some size presents us with a clear illustration of the fallacious nature of the argument which is founded on these buried forests, and which is supposed to prove a good deal as to the vast extent of the age of man. When the owner of a large estate resolves on devoting a portion of it to the growth of wood, he obtains a variety of young trees. One large portion of these are Scotch firs, another large portion are oaks, we shall say, and another probably consists of beech; others, in much smaller numbers, are

birch, ash, sycamore, or other varieties. Having obtained his plants, his agents go to work to place them in their stations of growth. In doing so they never think of making one large forest all of fir, another all of oak, another all of beech, and so on with the less important kinds on more limited areas. They so arrange the planting that all the sorts may be mixed in such a way that should one entire class be cut down, or fail to grow, the result will only be a thinning of the plantation or forest, as the case may be, and the absence of that peculiar kind of tree. Moreover, they so arrange the planting of these varieties, that those sorts that need shelter from the biting winds in their early growth, shall be close to those other sorts that are fitted to give that shelter. For example, the oak if left exposed by itself would be, from the outset, of the most stunted character; so would the beech, and the others of what are called the "hardwood" kinds. But when surrounded with the rapidly growing and bushy firs that keep on their green spines in winter as well as in summer, and break and soften the keen spring winds when the shoots of the "hardwoods" are tender, these "hardwoods" are enabled to grow tall saplings from the commencement of their forest career. In the course of years part of the firs are removed to give room for the better growth of those that remain still to shelter the more valuable wood, and by-and-by all these firs are cut down as trees that have reached their maturity, or they are taken away so as to give full scope to those hardwood sorts which they were intended from the first to shelter. The



oaks and others have now got large enough to grow without the pines, and to give sufficient "build" to themselves. Every one who knows anything of forest work will at once recognise the correctness of this sketch of its general plan. But in following such a plan as this, the proprietor of an estate, or his agents, only follow the course marked out for them in the growth of the natural forest. That does not consist of only one sort of tree on one mountain, or in one valley, and one other sort growing by itself in another. Nor does it consist of one class of trees requiring a certain equal period of time to reach their maturity, and to die off—all placed at the same period in one region, and another class of trees requiring another certain equal period of time to reach their maturity and decay, all placed in another region. No one who allows himself to think for a moment on the subject, if he really knows anything of it at all, can possibly think that this is nature's plan. The system of nature is just that which we have described as the system of art. A vast variety of seeds are somehow found in the soil. A vast variety of trees in their seedling state spring from that soil when it reaches a fit state for their growth. One class of these seedlings are hardy, bushy, evergreen, and of rapid growth, like the firs,—another are of slow and tender growth, like the sapling oak,—another sort is disposed to dwarf itself and to keep close to the ground like the hazel, or the elm if not surrounded with thickset shelter; but all are fitted to grow together satisfactorily, for a good long number of years. Then, at its proper

time, commences the thinning process in nature's own work, just as it commences in the artificial forest by the axe of the forester. The pines are the first to give way to the pressure of the gale, or to come down by their own weight, if not otherwise overthrown. The oaks may come down next, and before the other "hardwood" trees. That will depend on the character of the soil, and on certain conditions of climate; but the process of change in the character of the forest goes on in such a way as makes the falling trees belong to one class at one period, and to another class at a different period of that forest's history. Every one who knows anything of the woods of the world, must know that such is the law of their growth and decay.

There is only one thing to be noticed that in any degree modifies this law. Where the soil is not yet in a condition to grow anything but firs, firs will grow alone. When it has advanced in quality so as to be fit for oaks these will grow among the firs, but certainly without waiting for their final decay. Where the soil, and especially a warm, moist atmosphere become inviting to the beech, that will appear, but not so as to show that it waited for the removal of the oak. There is thus a wider distinction, so to speak, between the several stages of the forest's decay, and a more marked succession of the different kinds of trees; still the true arboreal law determines a mixing of all the sorts in the history, or life, of the forest. "The period of the Scotch fir," "the period of the oak," and "the period of the beech," are not distinct eras, but only dif-

ferent points at which the different sorts of trees in the same mingled forest reach their maturity and leave their trunks in the soil. If we would correctly reason on the succession of trees on any forest ground as furnishing us with the means of measuring time, we must not lose sight of this indisputable forest law.

This brings us with some degree of preparation to the reasoning of Sir Charles Lyell on the succession of forest growths during what he imagines was "the human period" in ancient Denmark. The peat formed on the surface of that country, Sir Charles tells us, fills hollows or depressions in the "boulder formation," laid down originally by melting ice. This peat is from "ten to thirty feet" thick. The lowest stratum of it is "composed chiefly of moss or sphagnum," and is from "two to three feet thick." Above this lies another growth of peat, "not made up exclusively of aquatic or swamp plants." Around the borders of these peat bogs in Denmark, and at various depths in them, there lie trunks of trees, especially of the Scotch fir, "often three feet in diameter," which must have grown on the margin of the bogs and fallen into them. From below one of these trunks of pine, Steenstrup took out "with his own hands a flint instrument." Sir Charles says that this trunk "lay at a great depth" in the peat, but he leaves us to guess what depth in the margin of a bog, only from ten to thirty feet deep on the whole, he would call "great." On this almost infinitely slender thread of evidence furnished by the discovery of this piece of flint, Sir Charles hangs the

not very important inference that the Scotch fir "was evidently indigenous" in Denmark "in the human period," that is, that men lived and used stone instruments in Denmark among these now buried Scotch fir trees while they grew on Danish soil. We say that the inference is not very important because men might have lived in Denmark since Scotch firs, grew there, and yet man's age on earth be even much less than Moses has led us to believe. It is well, however, to test the validity of the great geologist's argument in all its parts. We shall see what use he makes of this inference which he thinks so evident; but first, we must see if the gossamer thread of evidence really sustains it. Must we believe that a wedge of flint, if it is let fall on the surface of a bog, could not possibly sink down in and through the soft and half liquid peat, and that it could not possibly slip under a buried trunk of fir so as to be taken out by Professor Steenstrup's "own hand" in after days? So this piece of flint *must* have been buried beneath that old tree before that tree fell into the bog! Such is the argument. Were ever readers so unhesitatingly expected to accept the purest sophistry in the name of science? What might not the man who rejects the Bible say if our arguments for the divine inspiration of that book were like this? Can the reader really conceive of more consummate trifling? A piece of sharp flint falling into a peat bog has got beneath a round trunk of fir, *therefore* that piece of flint, as it could never get to that situation by sinking in the bog, was in that position before the pine tree fell! And therefore man lived in

Denmark while the Scotch fir was evidently indigenous there! Can we conceive of anything more thoroughly puerile? Yet such is the foundation—absolutely the foundation—every stone of the foundation too—on which Sir Charles Lyell expects us to build our faith in the validity of his argument for the vast antiquity of man from the succession of forests in Denmark! “It has been stated,” he says, “that a stone implement was found under a buried Scotch fir at a great depth in the peat,” and so he reasons! And grave heads are shaken in doubt as to the truthfulness of the history of man which came from the inspired pen of Moses! It is entirely forgotten that fir trees and oaks might long grow together, and so mark the same period, not different periods. It has not been convenient to tell us how deeply this fir tree was buried in the margin of the bog. It has not been thought wise to suggest that a flint wedge might very easily sink down through the watery stuff into which this fir tree had fallen long, long after that tree was there. Sir Charles Lyell is in desperate need of an argument to bolster up his theory. So “the age of stone in Denmark coincided with the period of the first vegetation, or that of the Scotch fir, and in part at least with that of the second vegetation or that of the oak.” Here is a momentous conclusion of science, based, not as Bacon would teach us, on a great assemblage of facts all severely tested in the crucible of sound logic, but resting exclusively on one solitary fact—and that a fact too which does not stand two serious glances of the dullest intellect that ever scanned a peat bog! We can-

not hesitate in saying that such reasoning is fitted only to prove the worst hindrance to science. It is altogether too bad. If it appeared as a specimen of logic in the junior class of one of our humblest schools it would fail to pass muster. And yet we are coolly expected by some "superior minds" to hide our heads among "fanatics" if we stand by our Bibles, and repudiate the President of the "British Association for the Advancement of Science!" But we must proceed.

That same wonderful Steenstrup whose "own hand" took the flint from under the buried pine, "and other good authorities," estimate the time required for the formation of the peat of Denmark at 4000 years. But Sir Charles Lyell says "there is nothing in the observed rate of the growth of peat opposed to the conclusion that the number of centuries may have been four times as great." That would give 16,000 years for the growth of from ten to thirty feet of this Danish accumulation. Grave men of science are often very much averse to a laugh, especially, like all of us, if that laugh is against themselves. But this argument is really too much for even scientific gravity. Just look at it in the light of one of the facts we have already noticed. It will be remembered that Sir Charles himself tells us (in his "Principles"), of a peat moss in Lochbroom in Ross-shire, from which the people "dug peat," and the moss was only fifty years old. The fifties in 16,000 are 320. Take twenty feet of peat, the average of from ten to thirty, and divide it by 320! How much peat had the Lochbroom

people "to come and go upon?" Will some of our young readers work out the problem for us? Will they also tell us what kind of spades the men of Lochbroom must have used in their peat-digging? We want the 320th part of twenty feet, and how to dig peat that thickness! We want to be told also how to put, even in imagination, an overwhelmed forest into the bog from which that stratum of peat, exactly 3-4ths of an inch thick, was dug!

Yet let us try to get to serious argument in canvassing this marvellous reasoning. We are not now concerned so much about the growth of peat, as about the growth of the forests that have been buried in the bogs where the peat has been formed. The trees that are found deepest in these Danish mosses, it seems, are Scotch fir. Those which occur at higher levels are "the sessile variety of the common oak." Still higher occurs "the pendunculated variety of the same oak," along with the "alder birch and hazel." Standing on the ground on which these buried trees grew, are the beech woods of Denmark somewhat now as Cæsar saw them when he invaded that ancient land. Sir Charles Lyell says that—"In the time of the Romans the Danish isles were covered, as now, with magnificent beech forests. Nowhere in the world does this tree flourish more luxuriantly than in Denmark, and eighteen centuries seem to have done little or nothing towards modifying the character of the forest vegetation." He holds that "in the antecedent bronze period there were no beech trees, or only but a few stragglers, the country being

then covered with oak." He goes back over the period of oak to the old pine forests, and on the strength of Steenstrup's flint, holds, as we have already seen, that there were human inhabitants who lived with them. Then he imagines many generations of pines before the oak appeared, and many generations of oak before the beech appeared. So he works up in the imagination a very long time indeed away back beyond that of the Romans for the period of the stone age, in which lived the most ancient Danes. But surely no one will accept this wild conjecturing for science. Where is the evidence that there was even one generation of Scotch firs before oaks appeared? It is surely strange science that asks faith without evidence. The fact that firs fell first into the boggy hollows is no proof that no oaks grew among these firs. Then where is the proof that more than one generation of oaks passed away before beeches appeared? The fact that the oaks gave way before the beeches, and fell into the bogs in greater number, even if it were a fact, is no such proof. The oaks might grow in greater quantity on the margin of the bogs, and the beeches on drier ground, and this alone would fully account for the facts as they stand now. Then where is the evidence that there were no oaks along with the beeches in the time of the Romans? The fact that Cæsar was struck with the magnificence of the beech-trees is no evidence that these alone grew round the margins of the peat-mosses in his time. We are always quite satisfied to draw upon our imagination for the details or for the mere dress



of an argument, but here we are expected to draw upon that source for the very essence of the reasoning ! We are expected also to abandon the analogies of nature's mixed forests, and to create in fancy long successions of unmixed generations of the same sort of tree coming on to, and passing off from, a country before the approach of another description of timber ! There is no way by which a man may become more surely engulfed in error than by implicitly following such a principle as this. Instead of patiently waiting on the slow but sure teaching of indisputable fact, he gives the first place in his soul to an imaginary conclusion. He then arranges what facts he may have at hand in such a manner as to favour this conclusion. He next draws upon his imagination for ten thousand fancied facts—all such as to favour his conjecture. He fortifies himself in this conjecture, and watches for all that may turn up calculated to enhance his fortification. If he has the opportunity he commits himself before the world to his belief, and stakes his life's reputation on the chance of its turning out true or false at last. All this is the very opposite—it is in fact the mortal antagonist of science. The predictions that are uttered in such a state of mind as to the anticipated discovery of this relic and the other that, it is prophesied, will be found in such and such situations, are all utterly unworthy of a scientific and truth-loving mind. That is always too much in earnest to see what really is, and to make the true use of what has been actually discovered, to be much interested as to what may possibly yet be found. Had Sir Charles Lyell

continued to maintain this truly scientific spirit he would never have written his volume on the antiquity of man.

The utmost age of history for Denmark is within 2000 years. If we go back 1000 more—that is in all 3000 from the present time—we have far more than sufficient time for the growth and decay of both the fir trees and the oaks, with the growth of all the peat in which they are found. We have then 4000 years of the Bible age of man still to draw upon, so as to account for all earlier changes during the life of man on earth, when we judge of the age of the buried trees according to nature's facts, and not according to geological dreams. The immensely inflated fancy that stretches the human age to 500,000 years has only to be approached by the touch of real science, governed as that ever is by stern logic, and it bursts and disappears. It is the purest dream that ever was dreamt by man, and our wonder is that it was ever possible as a waking thought to some of the noblest of minds.

## CHAPTER XVI.

## EXTINCT MAMMALIA.

WE approach now one of the most deeply interesting parts of our subject. All along we have been, as it were, pushing it aside as it intruded itself upon our notice, but not on account of its being in any sense insignificant, but rather because its importance calls for our reaching it only after the most careful preparation for its effective consideration. The long history of the earth's surface, as that is found engraven in its many volumes of massive rock, receives its intensest interest from the immense extent to which it is the history of living creatures. To investigate the composition of its granite and other crystalline rocks, to study the mechanical deposition of the layers of sandstone that were formed by the wearing ice and water power that has abraded previous formations and covered them with sedimentary strata, and even to investigate the remains of the ancient vegetation of the earth, would be dry work were it not for that knowledge of life which flows upon us as we ascend in our examination of the wonderful structure of the world. It is when we set our eyes on those vast beds which are literally composed of matter, which may be said to have been once alive, and begin to think of as many as forty-one thousand millions of shells in one cubic inch,

every shell of which enclosed a living creature, and we learn of millions of millions of tons of the rock which these shells compose lying above the more mechanical flags which were laid down before them, that we find the human soul, in its love of the living, stirred into the delightful feeling of the true naturalist. We have a mysterious sympathy with these very infusoria, just because they *lived*, and are made to live again in our imagination as we read their history, or peer through the microscope into their amazingly crowded tombs.

But the history of the once living myriads is now that of the dead. And the history of the dead is not that of departed individuals only, but of extinguished races. The process of the earth is one of continual change, and of change on a vast scale, so that whole genera of living creatures fitted to enjoy life at one period are found unfit to enjoy it at another, and they consequently pass from the world. The places of those who depart are filled with others who come on the stage of being, and so the wonderful succession goes on. We learn the character of this succession as it has been going on in all ages from the remains of the departed races, as these are found imbedded in the various strata composing the crust of the globe.

In certain rocks which have been regarded as the oldest, we learn of no trace of life whatever. In the first abodes of living creatures we have the remains of the most simple forms in which life can be thought of as existing. When we advance from one rocky formation to another of later date, the forms in which living beings appear increase

in complication, and indicate increasing fitness for enlarged enjoyment. Thus from the humble constitution of the sponge, we continue to rise through advancing grades of being, till we come up, by long long and many many stages, to man, incalculably the most complicated and capable of all the creatures that ever inhabited the earth. It is on account of this characteristic progressiveness in the races of living creatures that we find such importance in the present part of our subject. Every great advance in the direction of the higher organisations marks the commencement of what may be regarded as an era in the vast history of life in the globe.

In passing along the journey of the world's lifetime, as that has been travelled by all varieties of terrestrial beings, our great question is, *when* did man come upon the road? This may be looked upon as inquiring into the length of time that has passed since man was created. Or it may lead us to ask, as a previous question, at what stage in the succession of earthly life, the first living man was introduced. The answer as to the stage in the succession of the living at which man was brought into being has unquestionably an important bearing on the answer to the question as to how many years have fled during his existence.

There was a time, as we think all geologists agree, when there was no living creature on the earth—a time when there was not even a fish in the sea. Then came a time when there were living beings, but not even fish properly so-called. Then there were fishes of a peculiar type, but not even frogs. Then there were frogs, but no reptiles

as high as a lizard. Then lizards, but no birds. Then birds, but no mammals, or creatures giving suck to their young. Then marsupials, but no higher races. Then vast varieties of birds and beasts of the field. Ages on ages passed while these changes were going on, but, as all agree, there was yet no one on the earth in the form of man. Vast numbers of species of living creatures disappeared altogether from the sea and also from the land, but among the abundant relics which they left behind there is no trace of humanity.

This, however, brings us naturally close up to the point which we have now in hand. Many species of living creatures have disappeared from this world since man was on it, and it is argued that the fact of his having lived before certain of these became extinct, proves that his time on the earth embraces a period vastly greater than the 7000 years of Bible history. This is the substance of, by far the most laboured reasoning of Sir Charles Lyell on the antiquity of man. Let us then deal with this point in the argument as to the age of our race.

We must, first of all, carefully observe that many species of living creatures are disappearing from the stage of being *at the present time*. Birds and beasts that were familiar to men now living in their younger days are becoming altogether unknown, except in the memory of their existence. Professor Owen says—"The Great Auk (*Alca impennius* L.) seems to be rapidly verging to extinction. It has not been specially hunted down like the dodo and dinornis, but by degrees has become more and more scarce." He says—"The

last great auks known with anything like certainty to have been seen living were two which were taken in 1844." This bird was in vast numbers on the shores of Iceland, Greenland, and Denmark at no very distant period. We thus see beyond doubt that a race of living creatures that have held a very conspicuous place on the earth becomes scarce, and dies out entirely in a very few years. The same writer gives as another instance—"an amphibious animal like the manatee," which was described during last century by naturalists as inhabiting the shores of Siberia. It is now believed to be extinct. The auk and this *Rytina* are given as cases of the extinction of species without the interference of man. The dodo and dinornis are alluded to as species hunted out of existence by human beings, but many other species might be added to both classes as in the very fact of expiring, and so being numbered with the extinct races of geology. It is clear, then, that the mere fact of a race of living creatures with whom men lived having disappeared from the earth proves nothing whatever as to the vast antiquity of man himself. All along the path of human history as we go back from year to year, and from century to century, species have been becoming extinct, just as they have been disappearing, from the first date at which a type of living organism ceased to be fitted for the altered conditions of the world in which it had been placed by the Creator, and so was removed. We are thus careful and particular with this part of the argument, because so much is made of the mere phrase, "extinct mammalia." That man lived on the

earth along with what are now "extinct mammalia" is looked upon as a matter of such wonderful moment that to prove this seems to be thought sufficient with some minds to settle the question of his having been a creature of this world for hundreds of thousands of years! And yet men of the last century lived on the earth with what are now "extinct mammalia." As Professor Owen says, "a future generation may have to record the final disappearance of the Arctic buffalo." Then they will have to say that Sir Charles Lyell lived on the earth along with these "extinct mammalia." What will that prove as to the age at which he lived in this world? It therefore cannot be too carefully kept in view that the mere fact of certain species of elephants, and other similar creatures now unknown having lived with men, can of itself prove nothing whatever as to his vast antiquity.

But then there is the expression, "long since extinct," and the statement that such and such creatures are "not known to have lived in Europe since the times of history"—that is, during the last 2000 years. But what does this prove as to man's having lived on the earth more than 7000 years? We see, beyond all doubt, that in less than fifty years a species well known is extinguished. What, then, may not take place in the lapse of fifty centuries? If we would avoid the very grossest errors, we must avoid such utter emptiness of reasoning. Man lived on the earth, and in France, along with the mammoth, and the mammoth has not lived in France during the last 2000 years. How is the gap to be filled up which



carries the imagination back not only over 5000, but over more than a hundred thousand years? We are told we must go back at least 500,000! How is the chasm ever to be bridged by the bones of these "extinct mammalia"?

But we must come to more close quarters with this reasoning. Sir Charles Lyell's argument from the extinction of certain species with whom man lived on earth, is thus stated:—"Considerations of the time required to allow of many species of carnivorous and herbivorous animals, which flourished in the cave period, becoming first scarce, and then extinct, before the era of the Danish peat and Swiss lake dwellings." This leads us naturally to inquire as to the ground on which he concludes that the mammoth and its companions in extinction, had become extinct long, or even at all, before the time of the Danish peat-mosses and shell-mounds, or that of the Swiss lake dwellings. We find him saying—"No remains of the mammoth, or rhinoceros, or of any extinct species, appear" (that is in the shell-mounds), "except those of the wild-bull, which are in such numbers as to prove that the species was a favourite food of the ancient people." But is this evidence that elephants and rhinoceroses had died out of Europe? Denmark is a long way from Aurignac, and though the men who buried their dead there enjoyed the flesh of the mammoth, it does not necessarily follow that the primitive Danes should enjoy the same fare. A similar remark applies to the Swiss lake dwellings. No extinct mammalia but the wild bull have left their remains in connexion with these.

But, even if we admit the later age of this Swiss people, we must remember that the wild bull long survived the times of Julius Cæsar, and the fact of the extinction of its race does not carry us back 1500 years in the history of man in Europe. If we allow 2500 years as the age of these lake dwellings, we have still above 4000 amid which to go back so as to find the date of the flourishing of those ancient people of France, who are represented at Aurignac. In reality, the question of time in relation to the passing away of races of animals, is of the most conjectural character. The change which would thin their numbers might occur in a year, and that which would banish them in another. Sir Charles's weighty "considerations," are the mere vague and groundless impressions of his own mind. Take, for example, the mysterious epidemics that seize our cattle, and other creatures, and sweep away thousands in a single season. Or take the intrusion of an insect such as the tsetse fly of Africa, within the reach of which no individual of the ox tribe can live more than a few weeks. Let an insect of this kind come upon a region, and in less than two years there will not be one of the creatures to which its sting is fatal alive. Or take the occurrence of a peculiarly dry year with its influences, especially on the larger animals. Or take the effect of the races of men on the large mammalia, as in Africa, or on their own kindred, and other races, as in America. That effect is seen in the space of a few generations. And who will foist into his fancy a vast cycle of hundreds of centuries for the period required to remove the gigan-

tic mammalia from the haunts of men, when the superior creature has fairly got his footing on any land? The mere impression of a mind like that of Sir Charles Lyell, carried so completely away with fancy, but for his high scientific standing is scarcely worthy of serious dealing.

We shall now examine one of the most important facts in connexion with this question of extinct animals. This is found at Aurignac in the south of France, and near the Pyrenees mountains. Close to this town is the small limestone hill of Fajoles. In the year 1852, a labourer was working on the roads at the foot of Fajoles. He had observed that the rabbits, when hotly chased, ran into a hole in the face of the hill. One day he put his hand into this hole, and to his surprise drew out one of the long bones of a human skeleton. This led him to dig till he came upon a large stone door and opened a cave, in which the remains of at least seventeen persons, old and young, were found. Under these remains, both within and also outside the cave, was a layer of earth about two feet thick, and under that outside, but not inside, a layer of ashes, and a hearth of sandstone, on which evidently large fires had at one time burned. Among this earth, and mingled with these ashes, were bones of animals, of kinds now extinct, as well as those of living species, along with the works of human hands. Above these two layers of earth and ashes, outside the cave, was a mass of rubbish from the hill covering all over so as to make an even hillside, with its grassy surface, through which the rabbits had burrowed the small entrance by which they escaped

into the cave. There was such a mingling of human bones and other works of human art, with the bones of animals, both of long extinct and living species, in and outside this cave, as to leave no room for doubt, that the men whose burial-place it was, had lived in this same south of France along with the mammalia represented in the mass. We cannot but believe that the fact of man's having lived on earth and in Europe, along with many now long extinct species of animals is, by the contents of this and of many other caves, placed beyond all reasonable question. Among the remains found in this grotto were two molar teeth of the mammoth, and the bones of a young Siberian rhinoceros—also those of the peculiar species of lion, bear, and hyæna, belonging to the same period in European zoology, with the remains of the gigantic Irish deer and other extinct species both of “carnivora” and “herbivora.” The mammoth was a gigantic elephant, fitted for life in a cold climate, and altogether distinct from any elephant now known. The rhinoceros, covered as it was with wool, was of a species fitted for life in a cold climate also. So were all the creatures whose remains were here imbedded with those of men. There can be no longer much doubt in well-informed minds as to the fact of these now extinguished inhabitants of European valleys and hillsides, both men and lower animals having disappeared before the Romans invaded Gaul, so as to place on record what they saw, but the question remains, and there is plenty of scope for inquiry, as to what occurred during the 5000 years of human life which had fled previous to that invasion.

In former chapters we have had to deal with Sir Charles Lyell's ideas of the "alterations which he says have taken place in the physical geography of the districts" in which human relics have been found mingled with those of extinct animals, and we have had no difficulty in dealing with these alterations. But we must notice that we have no alteration to deal with here. At the very utmost there has been only the rolling down from the hill of a sufficient quantity of loose earth to cover the ancient hearth and door of the tomb in the hill-side, and even Sir Charles Lyell will not profess that it must have taken many thousands of years to accomplish this. He feels the force of the facts of this burial-place against his theory of a vast antiquity for the extinction of these races, and he tries to turn it aside; but the facts and their force remain. The men, moreover, who built the hearth, and placed the stone door to the burial-place at Aurignac, and the women who used the needle of bird's bone and wore the necklace of shells that were found with other things in that grotto, cannot have been the ape-like beings that are conceived of by Sir Charles and his friends as the early ancestors of our race. Yet they lived with the mammoth and rhinoceros in Southern Europe.

Is it then really true, or very credible even in fiction, that it is so very long since these "extinct mammalia browsed among the Pyrenees? The facts seem to defy us to believe it. If we are to overcome their force we must have facts very strong indeed, and of a contrary character. *But we have none.* If we should turn back not only

over 2000 years, but twice 2000, and even add another 2000 to them, we are still a long long millennium from the beginning of man's Bible history, and with what pretence at reasoning can we carry the burials of Aurignac or the departure of the mammoth and woolly rhinoceros back so far? It is mournful to think that men can be found who so easily surrender both their brains and their Bibles to a stream of dismal conjecturings. If it were in matters of small moment on which we might entertain any sort of opinion without injury to ourselves or to any one else, the case would be all a trifle from beginning to end, but when rational and well-founded hopes of immortal joy and glory are involved, the long, loose, rambling argument which is palmed upon men as science of the highest grade, and philosophy of the loftiest character, is inexpressibly to be deplored. No doubt the Bible and its author will rise triumphantly in the end from amid all such reasonings, and we may be so far consoled; but the evil done, and the good hindered, in the meantime are of most serious import.

## CHAPTER XVII.

## THE ARGUMENT FROM SHELLS.

As we scan carefully the scale of life, it appears that species of living creatures have a permanence in proportion to their lowness in the scale. When whole genera have been giving place to new comers on the land, the molluscs along the shore within high-water mark have been continuing the same from age to age, and still more humble forms seem to be again vastly more enduring than these. While it is comparatively easy to show that mammalia have died out during the human period, it is a very different matter to show that any species of shell-fish has disappeared. If such a disappearance could be shown during man's stay on earth, it would be an important argument for his great antiquity, though by no means a conclusive argument, and hence we do not wonder that the advocates for our vast duration as a race should make a great deal of work about shells. There is only one small shell-fish that seems to have left the beds of the rivers of Europe since man appeared upon its soil, and we shall devote a chapter to that instance itself, but in this chapter we must look at the argument from shells as somewhat differently presented. In the only instance of a tangible nature which Sir Charles Lyell gives us, he speaks of a change in the

growth of certain shell-fish in a particular sea. He uses this change to prove a great change in that sea itself, and so to prove the lapse of a great period of time since men dwelt on its shores. The careful reader will perceive that this is a very different argument from that which would arise in connexion with the dying out of even one species of shell-fish from the globe.

Along the coasts of nearly all the Danish islands there are certain mounds consisting chiefly of shells of oysters, cockles, and other eatable molluscs. These mounds were formed by certain ancient inhabitants of Denmark, who lived on these shell-fish. Of this there can be no doubt whatever. Men formed these mounds of shells by throwing the refuse of their repasts upon them during a great series of years. It is not to be doubted that these shell-fish were then found in the Baltic, close at hand to where they were eaten by these primitive men. But this fact in itself comes to nothing as a proof of man's vast antiquity. Nor does the fact that flint implements, and other relics of a "stone age," have been found in abundance in these shell-mounds, go for more in such a proof. We have shell-mounds of the very same character on the shores of Scotland, that cannot possibly be of any very great age. These two have the flints of a "stone period" among the shells. The Indians of North America have formed similar mounds of shells along the shores on which they lived, and they were still increasing their size when white men came to occupy their place on that vast continent. It was the age of stone, and of the formation of shell-mounds in



North America less than two hundred years from the present time. There is consequently no argument for man's great antiquity to be drawn from the mere existence of these mounds, nor from their being mixed with flint implements and other things characteristic of a comparatively uncivilized people.

But the eatable oyster, the cockle, the mussel, and the periwinkle, whose shells are found in these refuse heaps in Denmark, were of the full size which these mollusca attain in the salt ocean, "whereas the same species now living in the adjoining parts of the Baltic only attain a third of their natural size, being stunted and dwarfed in their natural growth by the quantity of fresh water now poured by rivers into that inland sea." The reader will at once perceive that this is not an argument founded on the permanence of species at all. It is an argument from the change of water in the Baltic from very salt water to that which is comparatively fresh. This change in the saltness of the water points merely to some shutting out of the ocean from the sea in which the change has taken place. This proves that the Baltic was accessible to the ocean in the days of these ancient men to an extent beyond that to which it is accessible now. According to Sir Charles Lyell this is "a striking proof, perhaps the most conclusive of all, that these refuse heaps are very old." So far, then, we have the argument for human antiquity from these shells. It is simply this—oysters, cockles, mussels, and periwinkles had salt enough in the water of the Baltic around the Danish islands to enable them to grow to full size during the days of the primi-

tive Danes—but the water of the Baltic has become comparatively fresh since then, so that oysters, cockles, mussels, and periwinkles grow to only a third of their full size now—therefore it is a very long time since the ancient Danes lived in this world. Or to put it in another form: the salt water of the ocean had access, “probably through the peninsula of Jutland,” to the Baltic then—it has not access now, therefore these shell mounds are very very old. This leads us to look to the history of this “peninsula of Jutland” to see, if possible, whether it must have been so very long since the ocean flowed over it into the Baltic. If that clearly may have been a comparatively recent affair, then the whole argument now in hand gives way. We are here dealing with what, as we have seen, the author calls “a striking proof, perhaps the most conclusive of all,” and if this is worthless what becomes of the whole argument?

Sir Charles does not leave us in any destitution as to facts by which to upset his own feeble logic. He says—“Even in the course of the present century the salt waters have made one eruption into the Baltic by the Lymfiord, although they have now been excluded. It is also affirmed that other channels were open in historical times which are now silted up.” Then this is part of the very region in which Sir Charles finds that there is a gradual upheaval of the land going on at the average rate of two and a-half feet in a century. As this is at the south end of that region where the rise is the least, suppose we take the upheaval at the rate of one foot in a century—that would

give us nearly twenty feet since the time of the Romans. Twenty feet would be a great deal more than enough to shut out the ocean, during ordinary tides, from getting into the Baltic through Jutland. If we take half a foot in a century we should have to infer that the bed of the sea had been raised ten feet in historical times, and this would make change enough to shut out the waters and dwarf the shell-fish. Where, then, is the force of this "most conclusive" proof of the great antiquity of these shell mounds? If we give them 500 years to accumulate before the time of the Roman invasion of Denmark, and take only six inches for rise for the land of Jutland in a century, we have far more than enough to account for the shutting out of the salt water from the shores of these Danish islands, and that carries us back not quite 2500 years.

Sir Charles tells us indeed that M. Puggard estimates the upheaval in Denmark at "two or three inches" in a century. If we accept this and give an age of 2500 years to these mounds, we should still have a rise of the bed of the Baltic and its surrounding coasts to a height of four feet two inches; and that in addition to all the accumulation in fiords and river estuaries during so long a period would be abundantly sufficient to account for the comparative shutting out of the salt waters of the North Sea from this part of the Baltic, not only as they come over Jutland, but also as they rushed through the Cattegat, when that was so much deeper than it is now. The oyster and its kindred still attain their full size nearer the entrance of the Baltic, and a very few feet of lower

level only are required to bring the salt tides sufficiently inland to enable them to live again around the Danish isles. This is giving the reasoning that is under review far more than fair play. It is confining the point of view to the rising of the shores, together with some rise in the bottom of the great channel through which the Baltic is entered from the ocean. We consequently keep out of sight all other changes, such as the filling up of the bed of the Baltic itself, and that increase of fresh water which may now be pouring into it. All this is in favour of the modern character of the change which Sir Charles thinks so very very ancient.

But we must not confine our view to this one aspect of the argument alone. We have another presented to us, in which the great geologist's reasoning is, if possible, seen to be more frail.

There is another fact advanced in connexion with these shell mounds. Sir Charles says that they are rarely placed more than ten feet above the level of the sea. Let us suppose that the rise of land is three inches in the century. Let us then try if the mounds might be 5000 years old. The three inches of upheaval in a hundred years gives twelve and a half feet in 5000. On this supposition the shell mounds originally must have been miraculously formed  $2\frac{1}{2}$  feet at least below the waters of the Baltic! Those of them that are now lower than ten feet above the level of the sea, must have been formed at still greater depths! This would prove that the men who formed them were not only very ancient, but very strange creatures to boot. But then they are partly com-

posed of "charcoal and ashes," so as to show that they were formed on the dry land ! Let us then try the supposition that they are 4000 years old. This would give us a rise in the land of ten feet since they were formed. So we should still have to believe that these shell mounds were formed at first under water ! We are not told how low the lowest is placed above the sea level, but if that is much under ten feet the case is all the stronger against a great antiquity. So again we find one portion of Sir Charles's reasoning eating up the other as effectually as ever a Danish allophylian swallowed an oyster !

How can such solemn mockery of all science ever lead to anything really worthy of the attention of mankind ? Would it not be unspeakably more noble if men would scorn all such speculation as the worst enemy of free inquiry ? Surely that inquiry is valuable only when it leads to truth. When it leads to nothing but such melancholy argument as this it is fitted only to lay up grief for all who follow it.

## CHAPTER XVIII.

## THE CYRENA FLUMENALIS.

WE come now to consider the only one instance of a species of shell-fish which has ceased to live in the waters of Europe since man was on the earth. It is not an instance in which a species has become extinct, for it is yet found in abundance, only not where it lived in days when flint tools used by human hands were dropt into the water around it. The specific name of this important mollusc is *cyrena fluminalis*. To give the ordinary reader some idea of the argument, in which this little creature occupies so prominent a part, we have only to state that its shells are found mixed with the ancient gravel in which flint tools that were used by primeval men are also found—these shells are so situated as to prove that this species of mollusc really lived in the bed of the ancient rivers into which these flint tools fell from the hands of then living workmen. For example, in the valley of the Somme, in France, in the lowest beds of the gravel which lies in contact with the chalk, flint hatchets and other flint tools have been imbedded when the gravelly masses were formed. The shells of the *cyrena fluminalis* are also found among the white sand that lies on this same gravel. The shells are so situated as to show that this little shell-fish

lived in the river or estuary whose bed was once formed of this very sand. But in all the rivers and estuaries Europe possesses, no living shell-fish of this species is now found. As another example of the fact in hand, shells of this species are found in Kent, on the banks of the Thames, and in such positions as to show that the creature lived in the bed of that river in far bygone times. Along with such shells there are evidences that man also lived in the region when the *cyrena fluminalis* flourished in England. In the gravel and sand of Shacklewell, in the northern suburbs of London, Sir Charles Lyell has collected great numbers of the shells of this little creature. The species must have flourished at one time in what are now the cool and often frozen waters of England, and in waters that were still more cold and firmly frozen then. But no living specimen is found at the present day in a colder climate than that of the Nile, in Egypt. They are found there and in several parts of Asia, especially in Cashmere, where they abound. No one can doubt that there is a vast difference of climate when that of Kent and even that of the Somme valley is compared with Egypt, and the argument seems to be that a change equivalent to that difference has taken place in Europe since man was on the earth, living along with the *cyrena fluminalis* when it flourished in the ancient Thames. It seems to be contended that England must have been somewhat as Egypt is now, in order that the *cyrena fluminalis* might live in the rivers of Kent, and consequently that our climate has changed from that of Egypt to what it is now. The time required for such a

change, and also for such other changes as have made this whole species of shell-fish disappear from Europe, it is contended, must be very much beyond that of six or seven thousand years. It is conjectured that the period must be, to our minds, immensely great. This species of small shell-fish could not disappear by the hand of man himself coming suddenly on the earth, as other species of living creatures may have had to disappear. It is held that it marks a change of climate, together with other geographical changes, implying a vast series of ages.

Like all the other arguments on this subject, this is of the very loosest description, and while it has great influence on certain imaginations, it can scarcely be brought within the reach of logic properly so called. It is a piece of the very roughest guess-work, such as proves strangely acceptable to minds incredulous to the adamantine realities of the Book of God, but it is incapable of standing the test of the slenderest application of close reasoning. The reader will see this more clearly as we proceed.

We must notice, first of all, that all the species of shell-fish which inhabited the bed of the Somme and that of the Thames, along with the *cyrena fluminalis*, live in the same localities at the present day. Whatever those changes may be which have led to the disappearance of this one species, they certainly have not affected the rest. The change has affected only this one species, and, so far, cannot be argued to be so very great. There is just one partial exception to this fact. The *unis littoralis* has left the Thames, but still lives in the



French rivers. All the other classes live both in England and France as they did when the *cyrena flumenalis* was among them. Sir Charles Lyell strangely endeavours to meet the force of this fact by stating that all the species of molluscs now inhabiting the Thames and the kindred rivers of France still range as far north as Norway and Finland. This, he evidently means us to infer, proves that they have been formed to live in a great variety of climate, and that the *cyrena flumenalis* has not been so. They no doubt survive beneath the ice of Norway, but this little ancient neighbour of theirs requires, if we at all understand his argument, the genial warmth of the Nile at least.

We must take due care to do justice to this part of the reasoning of the geologist. If the fact that this shell-fish now lives only in the Nile, or in hotter, but not in colder streams, is to be regarded as proving anything, it proves that the climate of England when the *cyrena flumenalis* lived in its rivers, and men with flint hatchets inhabited its plains, had a climate as warm, at least, as that of Egypt now. There is either no argument from climate in the matter, or that argument is founded on a change of this nature and extent, showing, as some view the subject, a vast period during which such a change must have come round. The idea is, that the *cyrena flumenalis* can live only in a river as warm as the Nile in Egypt at least—that, consequently, the Thames must have been as warm as the Nile is now when this mollusc lived in the English river—that men then enjoyed an Egyptian heat in Britain—and

this must have been a very, very long time ago, as the Thames is so very different from the Nile now. It will be important to observe, in passing, that this implies that the shell-fish of Norway and Finland, as these lands are now, can live in warmth as great as that of the Nile. It is very important that we keep this argument from heat in view. The only conceivable difference between England and Egypt in the matter of climate is not one of greater cold on the Nile than on the Thames, but of greater heat.

But this introduces us to another phase of Sir Charles Lyell's remarkable reasoning on this part of his subject. Why should he introduce the cold of Norway and Finland in connection with the heat of the Nile and of Cashmere? In the inquiry regarding the banished *cyrena* in question, we have no need of ice, but of a heat that forbids the presence of such a thing. He says that the presence of these other shell-fish in Norway and Finland now is proof that they could have lived in England and France when the rivers were annually frozen over during several months of the winter! But we are not in search of such a climate as that. We are seeking one of the Nile. We do need to find them so far north as Norway and Finland, but as far south as Egypt, in order to have the necessity for Nile heat to the *cyrena fluminalis* even presumptively suggested from its connection with them. They must be capable not only of living under Norwegian ice, but under an Egyptian sun, in order that the argument in this direction may even suggest anything to Sir Charles's purpose. The *cyrena fluminalis* has not

been banished to the north but to the south and east. The inquiry is as to how it could have been so banished, and how long time it may have taken for its emigration to warmer regions. Any change which can serve Sir Charles at all must be one from heat to cold in Europe, if the clime of Egypt is to the point. The *cyrena fluminalis* is found now only in a warm climate, as he seems to argue, but the molluscs with which it lived of old are found in very cold climates, therefore they and it must have lived together in Europe, in a climate much warmer than that which we enjoy now! Who can make anything out of such reasoning? If he had said that all the species found fossil along with this species are found now living along with it in the Nile, though it has died out of the Thames and of the European rivers, we might have thought this some little in favour of believing that the Thames and rivers of Picardy were then as warm as the Nile is now; but that these once neighbouring species should be living without this species in Norway and Finland has simply no relation to his argument whatever. It is not something to prove a cold neighbourhood that is wanted, but something to prove a warm one, and a vast period of time required for the hot climate's turning into a cold one. He says most truly that these molluscs may have flourished in the valley of the Somme "when the river was frozen over annually in the winter;" but he required to prove rather that they did flourish in that valley when its climate was like that of Egypt now, if he was presumptively to suggest that it was the setting in of a climate differing from the clime of Egypt which

caused the *cyrena fluminalis* to disappear from Europe. We are confounded when we see such utterly worthless arguments, if arguments they can be called, advanced in serious reasoning over so great a name as that of Sir Charles Lyell. And yet this is of a piece with all his other reasoning. It is actually reckless, though the Bible hopes of millions are in no small degree at stake on its issues !

This will, however, appear yet more strikingly when we bring the idea of an English climate, like that of the Nile, or of that which Sir Charles imagines for Cashmere, into comparison with that of his own description of the times when the flint tools were deposited in the French rivers, and the *cyrena fluminalis* flourished in their beds. "Let us suppose," he says, "that, at the time when flint hatchets were imbedded in great numbers in the ancient gravel which now forms the terrace of St. Acheul, the main river and its tributaries were annually frozen over for several months in the winter. In that case the primitive people may—as Mr Prestwich hints—have resembled in their mode of life those American Indians who now inhabit the country between Hudson's Bay and the Polar Sea." According to this supposition the flint tools fell into the river through the ice-holes made by these ancient men. Then what about the *cyrena fluminalis* and its climate of the Nile ? Here is the climate of Hudson's Bay and the Polar Sea ! It might be replied that there are no shells of this mollusc in the gravel of St. Acheul. They are found in lower level gravel at Menchecourt. This must be admitted ; but it is

accounted for otherwise than by supposing that the gravel in the one case was laid down amid the rigours of an arctic climate, and in the other under one like that of Egypt. The height of the upper parts of the river above the level of the sea, as compared with the haunts of the little shell-fish, will be quite sufficient to account for its having lived in the waters at Abbeville, but not higher up the valley. And then what are we to say about the deposition of flint hatchets in this gravel at Menchecourt? How could they get into the river in such numbers if there was no icehole, nor ice through which they might fall? The argument from the shell which we have now chiefly in hand requires a climate like that of the Nile in the valley of the Somme when the flint tools were imbedded there; but so far as we have gone we have got a semi-polar climate instead. How are we to extricate the reasoning of Sir Charles from this perplexity? Shall we argue that the gravel beds at Menchecourt were formed in an Egyptian heat, and those at St. Acheul in an arctic cold? He argues that the Menchecourt beds were the latest formed. If so, then the valley, from being of a climate like Norway or Finland, must have become warm as that of the Nile, and be now in process of cooling down again. But all such speculation is worthless; for the character of the remains of other creatures that are found in the Menchecourt drift, precludes such an idea. The bones and antlers of the reindeer are found in this drift. It will require very sturdy conjecture to associate this animal in our thoughts with the climate of the Nile. The evidence all points to a climate of

wintry rigour, such as is now experienced in northern regions, and certainly not to anything like that of Egypt. The dying out of the mollusc, therefore, to which so much attention is called, must be accounted for in some totally different way. It seems that it assuredly did live in a climate far colder than that of Europe now, even in Kent, and so it could not disappear on account of any such change as has been supposed.

There is a most valuable light thrown on this part of our subject from two facts—one related to the Nile, and the other to the rivers of Cashmere. The lower stratum of the Nile water is intensely cold. A friend who has bathed in it tells us that when he dived into this river he sank into such chilly water as made him fain to rise instantly to the surface, though at the time he was one of the hardiest of men. Then the climate of Cashmere is not properly a warm one. The winters are rather severely cold, and the streams cold also. It will be exceedingly difficult for any one to make out anything like such a difference in temperature between the streams of Europe and those in which the *cyrena fluminalis* now lives as to account for its disappearance from England or France and its now living in the Nile or Cashmere. For aught that yet appears it may have gone off from some cause affecting it which had no connexion with climate whatever. It may have disappeared in a few years. As constructed in the work of Sir Charles Lyell, the fabric of reasoning from the disappearance of this species of shell-fish from the rivers of Europe is so self-destructive that it cannot possibly cohere in any mind that is careful to think correctly on the most important of all

subjects. The argument, then, from the history of this shell for man's vast antiquity, falls utterly to the ground. It may be summed up somewhat as follows. The *cyrena flumenalis* lived in the Thames and in other rivers of Europe when ancient men used flint hatchets and let them fall into those streams, just as the reindeer and woolly rhinoceros lived and roamed on the European plains of England and France in those days. The small mollusc has disappeared as the larger fauna have become banished and extinct. It now lives in the rivers of somewhat warmer climes, as the reindeer and other creatures live in colder climes; but change of physical geography, and change of climate fail to account for the altered location of the species. Something else, which man has not yet discerned, must be found to account for such changes. Until some such discovery is made, it is sheer folly to measure by conjecture the time which such undiscovered causes may have required to work out their results. How long or how short it is, or whether it is long or short, since the flint-using inhabitants of Kent and of Picardy peopled the valleys of these countries, the history of the *cyrena flumenalis* does not yet tell. The attempt to bring chronology from such a timepiece is a signal failure. Poor indeed and vain is he who stakes his all for eternity on the validity of such reasoning as that which we have just been considering. The most unlettered need not envy him, even if he should have the reputation of the greatest of philosophers. Vastly better is the simple faith that lays hold on the tried Word of God, than the credulity that abandons them for such dreaming as this.

## CHAPTER XIX.

## THE ARGUMENT FROM SKULLS.

WHEN we have gone carefully over the various lines of argument for man's vast antiquity which are furnished by the character of the strata in which relics of our race are found, and by the remains of other creatures that have lived on the earth along with men, we arrive at that point in our discussion at which we are led to consider the character of those portions of the human skeleton itself which have been imbedded in the ancient rocks, or lodged in formations that must be regarded as very ancient. This introduces us to a part of our subject which has to do with more than the mere question of time. Especially as it is treated by Sir Charles Lyell and those who think with him, it bears rather on the true origin of man, than on the duration of his existence on the earth. It is wielded in reality so as to prove, if that were possible, that the human race is but an improved variety of the inferior animal creation. While Sir Charles expresses his sentiments with the greatest caution, it is, beyond all question, his own thorough belief that man is only an improved breed from the quadrumanous apes. Monkeys, in his mind, were the ancestors of those beings we choose to call men. It is for the sake of proving *this* that he is so anxious to prove that



immense ages have passed away since the "improvable reason" began to characterize the natural descendants of unimprovable brutes. The facts of the case are so sternly against his views that he is compelled so far to acknowledge their nugatory, if not their hostile character, but he clearly and closely clings to what may well enough be called his Darwinianism, in spite of this defect in his defence of it.

It is, therefore, important that the reader should have a somewhat correct idea of what this Darwinianism is. Suppose then that we have a flock of sheep. Among the young of that flock there will be a considerable variety, both as regards vigour of constitution and other elements of fitness for life in the circumstances in which the flock is placed. Some of the individuals of the flock will be strong and well adapted otherwise to their situation, others will be weak and comparatively ill-adapted. Nature, so to speak, will select the best adapted for living, and leave the ill-adapted to perish. Suppose that the circumstances in which the flock are placed are changing. Nature will select those best adapted to their new situation, and leave those ill-adapted to die out. In plainer words, the well-adapted will live, because fit to live; and the ill-adapted will die, because fit only to die. But those superior members of the flock will, it is believed, reproduce their superiority, and hence a superior flock will be the result. This process repeated during millions of years will at length cause such an advance as is sufficient to account for all that distinguishes a man of highest intelligence from the unreasoning animal now so far

beneath him. Sir Charles says—"Lamarck, when speculating on the origin of the long neck of the giraffe, imagined that quadruped to have stretched himself up in order to reach the boughs of lofty trees, and by continued efforts, and longing to reach higher, he obtained an elongated neck. (!!) Mr Darwin and Mr Wallace simply suppose that, in a season of scarcity, a longer-necked variety, having an advantage in this respect over most of the herd, survived them, and transmitted its peculiarity of cervical conformation to its successors."(!!) This is about as extravagant an illustration as could well be desired, and calls for no small amount of faith certainly on the part of those who can even keep their gravity during its announcement. If, say, the neck of a pig could be gradually elongated by such a process of dying out on the part of all the short-necked grunTERS, and the surviving of the long-necks, till the conformation of the swine had become that of the giraffe, what else could not be achieved? The brain of a gorilla, by a similar process, might, no doubt, then become that of a man. All that Sir Charles requires for the transformation is only *sufficient time*! This is the secret accounting for his wild conjecturing of such a vast antiquity for the human race. It is to get time enough for these incredible advances of grade in mundane beings. He feels that it is impossible even to imagine the gap between man and the highest of the lower animals being bridged over by an arch composed of stones infinitesimally small, without hundreds of thousands, or even thousands of thousands, of years consumed in the work. He

*hopes* yet to discover evidences of an antiquity for the race which will fully suit his purpose, and on these hopes he believes, evidently, in the monstrous theory of Darwin, and accepts all its dreadful consequences for man. But his own facts confound his argument, and his logic in this, as in his whole fabric of reasoning on the subject, significantly fails. This is seen most remarkably in his reasoning on certain old human skulls. He treats his readers to the history of these ancient skulls in particular, and to a vast amount of singularly rambling reasoning in connection with them.

The first of the skulls of which Sir Charles gives us an account was found in the floor of a cave at Engis, near Liège. It was imbedded in the same formation with the bones of animals that now no longer live in Europe. It had been that of a man whose muscular frame was greatly above the average of men now living, and whose brain was enclosed in a skull of very great thickness. But most unfortunately for Sir Charles's theory, he had been a person having a capacity of intelligence, so far as the size of his brain was concerned, up to, if not above, the average of human beings now-a-days. It is clear that he would have been more than an average man had he been one of ourselves in the nineteenth century. He was a cotemporary in Europe with the mammoth and the woolly rhinoceros, yet he was as fully a developed human being as might well be the chief of any tribe or nation of the most advanced race under heaven at the present day. He must have had a muscular development far stronger than that of ordinary men now, but we have seen an English

prize wrestler whose neck muscles, for instance, were at least five times the strength of those of common men. His skull, we have no doubt, had a corresponding thickness, and the insertions of all his muscular parts would come remarkably near those of the skeleton found at Engis. Such skeletons would be admirably adapted for preservation in gravel beds—far more so than thin skulls and slender bones that belong to weaker persons; but all this proves the opposite of Sir Charles's theory. It shows that man has not advanced, as he and Darwin dream of him. If this man of Engis was a fair specimen of the men of his time, then we have degenerated on the whole rather than risen in this scale of muscle and bone, and brain too.

And here it is well to notice the utter futility of the argument from an imaginary extension of time. This Engis skull, Sir Charles Lyell says, is "unequivocally ancient." It is in fact one of the relics representing the most distant epoch to which the geological record of man has been traced. Yet its conformation comes "near to the highest or Caucasian type." If a little more care in thinking and writing were exercised, it would be stated as above the average development of the heads of the most advanced nations this world yet knows. It is surely absurd to compare a solitary skull of such an age with the *largest* yet known among men. It would be felt to be absurd enough to compare it with the smallest of existing heads, and it is just as absurd to compare it with the largest. Its estimated capacity is equal to 75 cubic inches of water. "The most capacious

healthy European skull yet measured had a capacity of 114 inches, the smallest about 55 cubic inches."—"The largest cranium of any gorilla yet measured contained  $84\frac{1}{2}$  cubic inches." Such are the statements quoted by Sir Charles himself on the subject. Now we have no reason to say that this skull of Engis was the largest, or the smallest, or the exact mean of the skulls of its day. It is before us as an irresistible proof, however, that human heads were not all so near to that of apes at that time, or even all so near to the lowest development of heads in our own day, as to suggest the very slightest difference between the development of the ancient and that of the modern period.

Let us suppose, then, as some would have us to believe, that it is some 500,000 years since this man of Engis hunted the mammoth in Europe, and these 500,000 years have made literally *no* improvement on the human organism, what is the use of *time* in defence of the views which Sir Charles espouses? If nothing is multiplied by millions of millions, it comes just as really to nothing as if multiplied by nothing at all. Sir Charles admits—nay, he contends for—a limit to the age of man. That is, he goes back to a period in the earth's age when there could be no human creatures in the world. He says—"We cannot expect to meet with human bones in the Miocene formations, where all the species, and nearly all the genera belong to types widely differing from those now living; and had some other rational being representing man, then flourished, some signs of his existence could hardly have escaped

unnoticed in the shape of implements of stone or metal, more frequent and more durable than the osseous remains of any of the mammalia."\* If, therefore, we multiply the ages, and magnify our ideas of them ever so much, we must still have only a limited duration in view for the human race, and if, when we look at the head of a man as it is conceived to have been 500,000 years ago, and find that it gives no signs of real difference of development from average heads now—we say *no signs*—literally not even the shadow of a sign—how are we to conclude scientifically that ten times 500,000 years could have made *that* difference which is seen between the highest of the inferior creatures and man as he is, and for his whole existence on earth (so far as the proof goes) has been?

We must not fail to notice that certain differences between the conformation of this Engis skull and those of modern European type are spoken of. The "superciliary ridges," or bones above the eyes, are alluded to as unusually large. Also the insertions of the muscles in various parts of the skeleton, together with the thickness of the skull are spoken of. But no one will seriously assert that these features are unknown in human heads and other bones, belonging to men now living. It is impossible to take these peculiarities as evidences that man was less the rational being he is to-day when this Engis individual lived on the earth. Any one who looks in the faces of his fellow-creatures from day to day will see, here and there, eyebrows that stand out from the forehead

\* *Antiquity of Man*, page 299.

because of the uncommon strength of the bones that are behind them, and if he inquire he will find that such heads belong to men of superior force of mind as a general rule. He will see also muscles of such a strength as demands thickness of skull and of all other bones in order to their suitable insertion. But he will not find that such muscular development belongs to ape-like men. It very generally belongs to very superior men as compared especially with others of a different conformation. Sir Charles regards it as childish, we should think, to look for evidence of change in a generation; but here is the entire age of humanity from end to beginning before us, so far as the utmost fact has revealed it, and yet no evidence of change. How then by multiplication, or magnifying, can we reach his theory of man's development, or his entrance on the world in the way of this Darwinian fancy?

Sir Charles mentions a fact in reference to the Negro which may be noticed here. He refers to "pictures on the walls of ancient temples in Egypt, in which a thousand years or more before the Christian era, the Negro and Caucasian physiognomies were portrayed as faithfully and in as strong contrast as if the likeness of these races had been taken yesterday." This proves that a man with a negro physiognomy, and one with a Caucasian physiognomy are still the same objects in the mind's eye that they were more than 3000 years ago. It may perhaps prove that the great family types of countenance in races have not changed during these 3000 years. Even if it proved that a lapse of 3000 years makes no change

whatever on the human being, how could all this prove that any number of thousands of years could make so great a change as to transform the gorilla into a man? This question is strong enough, but it is far stronger when assisted by the vast antiquity insisted on for the man of Engis. The hundreds of thousands of years that have fled since Sir Charles Lyell imagines men lived with "extinct mammalia" in Europe having made no change, how then can any change be guessed at through any extravagance of expanded duration?

But this brings us to another ancient skull which was found, "in 1857, in a cave situated in that part of the valley of the Düssel, near Düsseldorf, which is called Neanderthal." The passage from the surface into this cave, into which loam and other things had been washed, was easily traceable. The skeleton to which the skull belonged was lying in mud, without any crust of stalagmite over it. There was nothing to indicate that this skull was of any very ancient date. But Professor Huxley has pronounced it "the most ape-like skull he had ever beheld." The evidence, so far as it goes, however, is all against this being the skull of a very ancient man. The superior one of Engis is, beyond all reasonable doubt, as old as the race of man is yet geologically known to be—this of Neanderthal has no claims to such antiquity. It is indeed probably the skull of some abnormal being who perished at a comparatively recent date. This is a most stumbling fact in Sir Charles's way, but he is not easily stopped or led to hesitate in his headlong course of speculation. Nor are his coadjutors easily made to halt



in following him. We are merely told that we must go further back for these men through whom, so very gradually, our forefathers sprung from the lower creatures. The evidence leads us forward, and tells us that men have degenerated; but, in spite of the evidence, we are still told we must hold on in the opposite direction, if we would reach this most undesirable goal! Professor Huxley says—"The first traces of the primordial stock whence man proceeded need no longer be sought by those who entertain any form of the doctrine of progressive development, in the newest tertiaries; but that they may be looked for in an epoch more distant from the age of the *Elephas primogenius* than that is from us." But by what admirable process of reasoning are we to go thus back into eternity for the origin of man? If 500,000 years have made *no* advance, but such as is indicated by the Engis skull coming down to the standard of development shown by that of the one of Neanderthal, how are 500 millions of years to bring us to the point at which we shall reach the ape as the great-great-grandfather of man? Is it on such a principle as this that so-called scientific men glory to argue? And yet such is the *bona fide* principle of the Darwinian philosophy as represented in the case before us! We feel sure the reader will suspect us of mis-representation; but no! we are giving the unvarnished absurdity just as it stands in the argument from these skulls.

The third relic of this description is a skull from Borreby in Denmark. The one presented in the argument of Sir Charles Lyell is taken from

among a number belonging to "the stone period" of the Danes. It has "remarkably projecting superciliary ridges, a retreating forehead, a low flattened vertex, and an occiput which shelves upward and forward." But Professor Huxley says that these Borreby skulls "were subsequent to the last great physical changes in Europe, and were contemporaneous with the urus and the bison, not with the *Elephas primogenius*, *Rhinoceros tichorinus*, and *Hyæna spelæa*." This then is another fact in the wrong direction for the theory of man's development from the apes. The skulls represent degradation, not improvement. So far as they say anything, they tell of humanity going back towards the brute state, not of its leaving that state by stages however slow. The force of this argument is supposed to be met by the fact that species of animals occasionally show a tendency to go back in individual cases to a primitive type. It is really the truth that such a retrogressive tendency exists in nature. At distant intervals in a flock, individual lambs will appear that have not the improved character of the breed to which the flock belongs, but the inferior character of that flock from which the breed originally sprang. But this law, if it may be so called, has its action in two opposite directions. An individual of a degenerate flock will occasionally give birth to a superior lamb, such as was the general offspring before degeneration took place. To reason on this law, as Sir Charles has done, is simply to reduce his whole argument from the bones of these ancient men to nothing. And, as we have more than once had occasion to remark, no amount of

merely nugatory argument can ever prove anything.

We have thus pretty fully sifted the argument from these three skulls, and the reader will be able to judge how much there is found in it that tends to prove the vast antiquity of man. It seems to us to prove the very opposite of that which it has been constructed to support. The superior head stands at the very utmost point to which the most enthusiastic geologist has ventured to carry back the discovery of relics of man. The inferior heads are confessedly vastly more modern, and Australian heads with which these have been compared are specimens of heads such as are worn now by living men. It seems as if the very reverse of the theory of Darwin were the truth. Instead of a low and brutal race giving birth to the rational human being—a noble and godlike beginning in humanity has been followed by a melancholy departure in the direction of the beasts. True science is again steadily doing what it has always done—making the wisdom of divine revelation appear in greater glory. Alas! for the men who leave that revelation in favour of baseless fancy like that we have in hand.

## CHAPTER XX.

## THE ARGUMENT FROM LANGUAGES.

IN endeavouring to work out a theory, or something like a theory, according to which man has risen by natural generation from the lower animals in the course of vast ages, Sir Charles Lyell has directed attention, at great length, to the development of languages. The idea evidently swimming in his mind is something like the following. As the distinctive forms of words which mark the character of a language are constantly changing, though very slowly, and as this constant change is giving rise to new languages among mankind, so the forms that mark the character of a species of living creatures are constantly, though slowly changing, and this change is giving rise to new and higher species. The change in languages is slow, he thinks, but the change of species is vastly more slow. The new language comes all but imperceptibly into existence, so the new species must come much more imperceptibly on the stage of life. If you can allow only sufficient time—vast and immeasurable ages—the difficulties in the way of the natural formation of new species of living creatures by ordinary generation, are as easily removed as those which might beset the untutored mind, in attempting to conceive of the natural formation of a new language! For ex-

ample, just as the apparently settled language of a tribe in the course of a century, or of much less than a century, changes so much that at the end of that period that tribe are found speaking another language unintelligible to any offset families who have kept to the old tongue of the tribe, so, if we have only time enough, may the form of a snail have become that of an eagle, or the brain and other parts of even an eel have become that of a man ! Sir Charles goes round and round this result of his speculation like a dog going round a hedgehog, but it is easy always to perceive what he would be at if he could only see his way by means of sufficient time !

Sir Charles supposes a philologist who shall try to convince an audience of intelligent but illiterate persons that the language spoken by them is but a modern invention. These persons would be ready to exclaim against such an unlooked for doctrine. They should cry out for "evidence of such incessant variation in remoter times" as the theory demands, or if admitting that there had been variation they would ask—"why not imagine that when one form of speech was lost another was suddenly and supernaturally created, by a gift of tongues, or a confusion of languages, as at the building of the Tower of Babel ?" It is not difficult to see the drift of this illustrative reasoning. We are taught by it to think that it is as truly the result of ignorance, if not of folly, to believe in the separate and supernatural creation of different species of living beings, as it would be the result of ignorance and folly to insist on the supernatural creation of modern tongues. Latin

slides off so naturally into Italian, or into French, or into Spanish ; so one species slips imperceptibly into another—only give us sufficient time for a change (which is, as we have seen, imperceptible in the lapse of even 500,000 years,) and all will be clear !

It is worth our while to look a little at this argument or illustration, from the growth of languages to the growth of species. One thing which strikes us at the outset is the fact that languages are liable to change with incredible celerity, *when those who speak them are "in a state of nature."* If a single family is broken off from a savage tribe, and lives say for a year or two by itself in the wilds, its language has so changed in the brief interval as to be unintelligible to the tribe from which it separated. This is the strong testimony of one of Darwin's most enthusiastic followers—"a naturalist on the Amazons." There is, he says, so remarkable a fondness for coining new words and forms of expression, in the mind of the savage races that their languages pass through the most rapid revolutions. It is a very different matter, as we shall afterwards more fully see, to look at the comparatively lasting character of a language among a people who use every appliance of art to keep that language in a state of permanent purity according to a somewhat unvarying standard. Where the language is written, and, as in the case of our English Bible, it is universally and constantly read, both in public and in private, the changes which creep in on that language must come very slowly. It is altogether different with natural

language left to the changes that affect it from the capricious fancies of a savage, or comparatively savage, people. It will not do when trying to show the slowness with which variations occur in cattle, for example, to consider those breeds that are artificially preserved in a state of purity from generation to generation, and even from century to century, and neither will it do when looking at the changes of language as a kindred affair to consider such languages as are artificially preserved. When we take both as they are presented to us in a state of nature, we find that they cannot in reality be compared at all. The speculation founded on such a comparison is consequently worthless.

But there is another feature in the character of language, when left to what is called nature, which makes it unfit for the purposes of the argument in which Sir Charles Lyell has employed it. Language is not improved naturally—it is corrupted. It may be and is improved, but that is by art and not by nature. All that zealous literature and enthusiastic education can do is required to keep our own mother tongue from degenerating, and that, too, as it is used generally even by the most civilized of our countrymen. All may know the sad work which is made of it when left to the tender mercies of the great masses of men. It becomes, comparatively, but a miserable and strangely confused and corrupted fragment of one of the most comprehensive of human languages. But the same is the fate of language all over the world. There is always and everywhere a retrogression and not a progress in the changes that

affect the languages of men, except where powerful artificial means are used to secure an opposite result. In those changes which are to account for the existence of new species of plants and animals, we must find, if we would find anything to the purpose in this argument, just the reverse of this which characterises the changes in language. As the world goes on, making its history, so to speak, we see a higher grade of creature constantly succeeding a lower—not a lower succeeding a higher; but in the changes that naturally affect language we see a higher always and everywhere giving way to a lower! The “classical” in all cases, when committed to nature’s care, among the mass of men becomes the “vulgar”—that is the immeasurably inferior. Sir Charles Lyell has compared the formation of new languages with the formation of new species; he ought rather to have placed them in contrast. In the domain of nature species rise in the scale of excellence; languages in the same domain degenerate, and rise only in the domain of art and education. His attempted argument, therefore, from this source, goes for less than nothing.

There is another point worthy of consideration in this matter of language. When we see how rapidly languages change among a people in a state of nature, and observe that tongues invariably degenerate, unless artificially maintained and improved, how can we account for the existence of such a thing as a language among the human race? With a strong natural tendency to carry even the classical Greek of a Demosthenes back to the “click of the Bushman” (as Sir



Charles expresses it), how are we to account for the gradual ascent from still less than that "click" by which men reached at length the instrument of even Grecian eloquence? If you grant us the belief of a divine inspiration imparting a language which is capable of great improvement, in spite of the truth that the mass of those who receive it will corrupt and all but destroy its essential elements, we can see our way to a full understanding of all the facts of the case. But if you refuse our belief in this inspiration and tell us that a corrupting and degenerating agency improved upon brute sounds, until they rose to the dignity of human language, and that this same agency improved that language till it reached its highest pitch of excellence, we find that we are being led off into the region of the wildest dreams. Sir Charles frankly admits that the origin of language, like that of species, is a mystery. But he makes strange work of the form which he gives his admission. He says—"In our attempts to account for the origin of species" (that is, as compared with attempts to account for the origin of different languages), "we find ourselves still sooner brought face to face with the working of a law of development of so high an order as to stand nearly in the same relation as the Deity himself to man's finite understanding, a law capable of adding new and powerful causes, such as the moral and intellectual faculties of the human race, to a system of nature which had gone on for millions of years without the intervention of any analogous cause. If we confound 'Variation' or 'Natural Selection' with such creational laws, we deify secondary causes,

or immeasurably exaggerate their influence.”—What does all this really mean? “A law” is said to be “capable of adding new and powerful causes,” to the system of nature! “Laws” are said to be “creational” even of “the moral and intellectual faculties of the human race!” What does he mean? Is not a law a rule of action? Surely a law is not an agent, or actor, but a rule according to which an agent acts. How, in the name of all that is reasonable, can “a law” *create*? But what does Sir Charles mean? “Variation” is a law according to which one creature is made to differ from another. “Natural selection” is a law according to which creatures well fitted to live in certain circumstances, are kept alive, while others not so well fitted are allowed to die. We can think of laws *according to which* even the moral and intellectual faculties of the human race are created, but all true, or even rational thought on the subject demands that we think of some one whose laws of action these are. Sir Charles speaks of deifying “secondary causes,” but is it not as absurd to deify “laws”? There is a such a thing as mystery—there are necessarily regions of mystery to the finite mind that may be said to be infinite, but we need not unnecessarily confound our modes of thinking in such a way as to cause seeming mystery where there is none. When we have accomplished the easy and common-sense task of setting aside all such absurdities as “creational laws,” and imaginary “secondary causes,” and our mind’s eyes rest on the true Cause by whom alone creation can be effected, a world of seeming mystery has fled. He who

is the Great Living Cause, to whom we are compelled to trace these effects for which no other cause can possibly account, is surely capable of giving a language to the creatures whom he has created capable of speech, and so we need not bamboozle our intelligence by going away from the thought of His acting to the gross absurdity of "laws" acting, even in creation itself. If it is once clearly seen that the Living God could as easily give a language as he could give the capacity of using a language, and that no "*law*" could do either the one or the other, a vast amount of mystery in which the subject is involved is swept away. So, if it is once clearly seen that this Living God could give a creature higher powers than those which he had given to other creatures, as easily as he could give being to either the one or the other, our path to a full understanding of the varieties found in the universe is in no small measure cleared. Then we have merely to study the records, so far as these are within our reach, in order to see how this Almighty One has really acted. If we direct our inquiry either into the region of language or into that of species we are precluded, by all the evidence which presents itself, from believing that he has acted in the way of that development of which Sir Charles and his followers have become so fond.

But there may still be a lingering thought in the inquirer's mind as to the reality of a natural degeneracy in tongues and in species. He may be ready to say that surely barbarous languages have been improved, so as by-and-by to become classical, and herds have been improved so as to

rise to excellence of the highest order. He may allow that he cannot account for the actual origin of any one language, nor for the actual beginning of any one species, yet he must contend that a poor tongue has been developed into a rich language, and that a useless species has been brought up to a point of improvement at which it is found to be of the greatest value. And he may ask, since such is the case, why might not language itself be improved into existence, so to speak, by its gradual development from the sounds of the so-called "dumb creation," or why may not the creature man be the result of development from the lowest living creature in the world? We have already virtually replied to all such questions by noticing as we have done the distinction between natural and artificial influences, but it is well to do so explicitly and fully. The improvement of languages, and the improvement of species, so far as science reveals such facts, are the result of the creative will of man, directed to this improvement as his aim. Apart from this will, intelligently directed to the improvement of languages and varieties of plants and animals, there is no improvement in this world such as could ever suggest the idea of a lower species improving into a higher. Man is not only an improvable creature, but an improving cause in himself. In his improvements upon language and on species of living creatures, he is a counteractive cause. He battles with a degenerative tendency of a powerful character, which makes its presence felt always and everywhere. The counteractive power which is exerted by the few, who stem for a time the tide

of degeneracy, and even carry on their enterprize successfully in the face of it, is ever on the point of being driven back by the retrogressive tendency of the great mass even of human beings, and by a similar tendency in all that man ever tries to improve.

It is indeed to be observed that there is an instinct among the lower animals that bears a certain analogy to the improving energy of the human mind. Many of these lower creatures are found to hinder as far as possible the breeding of an inferior race of their own kind, and to destroy degenerate members that appear among them. But while this may in some measure retard the degeneracy of a species, it never, as a matter of fact, improves it. For it is not a law in nature that the highest developments always spring from the most highly developed. The most degenerate are often the offspring of the most improved, and so far as "natural selection" goes among the lower creatures it fails to prove itself a principle by which a standard of development is maintained. Degeneracy comes on in spite of it. Man by his art and the power of a strong will, so far imitates his great Father in improving on a state of nature by means of his own creative acts, and in taking advantage of opportunities afforded him ; but the day in which he relaxes his energy in the direction of that improvement, all he has improved falls back into degeneracy. Why then should we believe the very opposite of the truth and imagine an improbability in unintelligent creation, capable of accounting for all the stages of development from the lowest creature up even to man ? So

far as any language is in fact improved, it is so by the constant efforts of superior minds directed to secure its improvement. So soon as it is left by these agencies to the operation of the degeneracy which belongs to man as a race, it begins to undergo change for the worse. So far as any species of plant or animal has been improved, that too has been so improved by superior minds directing their skill and energy to secure such improvement. So soon as the species has been left to itself it has begun to lose its higher characteristics, to fall back, not perhaps into exactly its former state, but into one equally inferior. How in the face of this law, even if granted millions of millions of years, can men rationally hold to a system of accounting for the vast variety of the living in this world by an imaginary improvement of the lowest creatures into higher up even to man? It would surely be vastly more worthy of true science to admit that all the evidence goes to show that the Mosaic principle of creation is that actually followed by the Great Originator and Up-holder of all.

## CHAPTER XXI.

## MEN COMPARED WITH LOWER ANIMALS.

THERE is a passage in Sir Charles Lyell's work, on which we have commented already so fully, that calls for special attention. He says, "But will not transmutation, if adopted, require us to include the human race in the same continuous series of developments, so that we must hold that man himself has been derived by an unbroken line of descent from some one of the lower animals? We certainly cannot escape from such a conclusion without abandoning many of the mightiest arguments which have been urged in support of variation and natural selection, considered as the subordinate causes by which new types have been introduced into the earth. Many of the gaps which separate the most nearly allied genera and orders of mammalia are, in a physical point of view, as wide as those which divide man from the mammalia most nearly akin to him, and the extent of his isolation, whether we regard his whole nature or simply his corporeal attributes, must be considered before we can discuss the bearing of transmutation upon his origin and place in the creation."\*

These sentences are followed by an elaborate discussion of man's anatomical structure as compared

\* *Antiquity of Man*, pp. 472, 473.

with that of the apes especially, and the conclusion indicated hesitatingly and yet not obscurely is, that man has come by ordinary generation from that honoured ancestry ! It is impossible for any one in such a discussion as this to be oblivious to those grand characteristics which mark man off from all the lower creatures—for example, his moral and religious faculties. Hence Sir Charles takes full notice of these, and especially of man's improveable reason ; but then these are regarded as in some way products of the brain, and it is more than conjectured that the form and degree of cerebral development from which they are assumed to arise, are only results of the "variation and natural selection" by which, according to the transmutation theory, all higher species have sprung from those that are beneath them.

A very natural question at once arises as to the links of connection that are to prove the truth of man's gradual development from the apes. This is met by a reference to "imbeciles, half-witted persons, and those of perfect understanding," as exhibiting "a passage from the rational to the irrational, or from the irresponsible to the responsible." He tries to show that it is as difficult to say where reason and responsibility begins in these as to point out the link of connection between brutes and men. The subject of *evidence*, such as would at all prove the theory of transmutation, is clearly Sir Charles's great difficulty. He is driven, if we mistake not, to shift his ground, and that most marvellously, under the pressure of this demand for the "missing links." So he even "demurs" to the idea of an insensible passage



from the highest intelligence of the inferior animals to the improveable reason of man. The birth of an individual of transcendent genius, *of parents* who have never displayed any intellectual capacity above the average standard of their age or race, is a phenomenon not to be lost sight of. This same "insensible passage" is the very thing for which he has been so anxious to establish the extreme antiquity of man, yet he is ready to abandon it! He pleads that "such leaps" as that from the ordinary mind to genius, show that nature "may have cleared at one bound the space" between apes and men! By this it would seem as if no great antiquity need be pled for in order to establish the favourite theory of transmutation of species, even up to man's ~~being~~ being the natural offspring of the chimpanzee or the gorilla; but the case is not as it seems. It is only as it were for a moment that the leap from a pair of gorillas as the parents to the first human being as their son can possibly be endured. The arguments of Sir Charles in this last chapter of his book are too frail to sustain anything but a very brief delusion, and hence there remains the strong desire for incalculable time into whose misty region theorists may gaze, expectant of proofs which as yet are unknown.

We may here remark that we see no need whatever to contend for man's anatomically differing from the lower animals. If the body is the instrument of the mind, and the mind not a mere product, or result of material organisation, there seems to be no great reason why we should be anxious to discover *material* distinctions of great

breadth between us and the brutes. Sir Charles furnishes us with a most apt illustration of what we mean. He says, "The embryonic states exhibited one after the other by the human individual bear a certain amount of resemblance to those of the fish, reptile, and bird, before assuming those of the highest division of vertebrata." To the man whose mind is fully under the power of the idea that matter produces or is developed into mind, this seems to prove that the human being is altogether the result of material development; but what does the fact itself teach us? How is it that the embryo throws off successively its fishy, reptilian, and birdlike character, assuming as it ultimately does, the human form? Is it not because of that living mind that has been given to it from the outset? If we could suppose that there is not a shadow of difference between the embryo fish and the embryo man, how can we account for the one becoming a fish and the other a human being, but by reference to the difference between the living principles by whose presence the embryos are thus so differently developed? Let us carry out this argument. If, as Sir Charles Lyell and his friends so earnestly argue, there is no distinction (with the exception of a little difference in size) between the human brain and that of the ape, how is it that the two heads give out such very different results? The ape is by no means the most intelligent of brutes. It is miles away, so to speak, from man when compared with several of the other lower creatures. The likeness in intelligence of the elephant to man is immeasurably nearer than that of the ape. How is the

intellect, conscience, and immortal aspirations of man accounted for since his material body is every way so near to that of the Simian? Does not the question point us to a distinction in spirit substance? Does it not tell us that two living spirits may be so different that the one shall use an organisation as a man and the other the same organisation as a brute? This is the Bible idea, and the facts of science prove it. The spirit of the man goeth upward—that of the beast goeth downward; there is an immeasurable distance between the spirits, though the bodies both equally go to the dust. We have been told by one of the first men in the ranks of those who have studied mental disease, that the brain of a perfectly sane man has been compared with that of one who died in a paroxysm of madness, and not a shadow of difference discovered between the two. Does not this tell us that different *minds* will give opposite results through the same organism? Materialism is lame in true science.

It is unfortunate for Sir Charles's ideas that he speaks of the birth of men of genius, as if such events had any real likeness to the birth of new species. Can any one tell us of the man of genius who had a man of genius for his son? Do great men propagate their greatness? Is it the law of nature in this respect to send down the vast intellects and capacious hearts of our great men from generation to generation, so that if we once secure a first class specimen of the human being, we can count on having a breed of the same? The reverse is the law, as every one knows, who knows anything on the subject. It does not help

us therefore in the direction of transmutation from the lower animals up to man—nor from a lower to a higher animal—to tell us that men of mark are now and again born of very humble parents. It lacks the far more important fact that these men of mark should have sons of mark as an ordinary rule. The mollusc could never reach the monkey, nor the monkey the man in this way, even if you give them an eternity to do it in. As Hugh Miller has so signally pointed out in his “Footprints of the Creator,” the law of species is to degenerate, not to improve; so is the law of the human species as represented by the offspring of genius. How then can this ever prove a transmutation of species by which an ape is supposed to give birth to a man?

We have, however, another field to survey. What about those “imbeciles and half-witted persons” to whom Sir Charles refers us? We cannot tell, he says, where the irrational ends and the rational begins among them. Nor can we say, as he avers, where the irresponsible ends and the responsible begins. Under this head Sir Charles takes in the millions who die in infancy, as well as the imbeciles and half-witted, in the not very scientific way of meeting one set of difficulties by stating another of a totally different character. Just as he and his friends cannot say where the link of connection is which joins monkeys and men, so we cannot tell the point at which the infant passes into the adult man! He is bewildered. There is no analogy between the cases presented in the argument. The imbecile human being is not any nearer the well-developed

ape than is the human genius, when we consider those properties that mark off the one species from the other. A malformed, or diseased individual of any one species is not on that account any nearer, in specific character, to the healthiest individual of another species. An imbecile human being is a man so far as he is anything. So is a half-witted human being. So assuredly is an infant. So is the most wretched savage. Even the imbecile has an improvable reason, but the most anthropoid ape has none. Then the difficulty in the imbecile is a defective brain—a difficulty from an unsound material organism. The difficulty (if we may so speak) of the ape is not of this nature, but rather in that of the living being itself. Between even the imbecile and the ape we have no difficulty in saying where the irrational ends and the rational begins. The irrational ends with the ape and begins with the imbecile, for the moment we can reach *mind* through the defective organism of the imbecile, we find it is rational and improvable as the successful education of imbeciles has abundantly shown. So all the mind, if we may so call it, which we ever reach in the ape, is irrational. The same is the case with the infant. So soon as the mind of the infant discloses itself, it is found to have improvable reason. In the ape it never is so. But there is surely something strangely unscientific in directing attention to diseased and infant individuals of a species as if these could throw any light on the differences of being, that are known as the foundations of specific distinction itself. We look to the healthy and fully developed when we are desirous of

noticing true specific distinctions, not to the diseased or undeveloped. Distinctions of individuals that are caused by disease are such as affect an individual only and not a species, nor even a variety. Distinctions between the infant and adult are temporary and not to be thought of at all in such a question as this. If we are to take note of distinctive features in the cases of the young, they must be distinctions between those of one species and those of another. That which we crave, however, from the advocates of this transmutation theory is evidence that two of the irrational and irresponsible of the lower creatures are the parents of one who was rational and responsible, and that he transmitted his reason to those born to him. It is of no use to dance round and round a point like this when, beyond all question, it is the chief point in hand. We assert that there is not only no evidence of such a transmutation, but that it is contrary to the observed course of nature. It is not contrary to this that parents of a species should give birth to superior individuals of the same species, or to inferior individuals of that species ; but this is not in the least degree to the purpose, when the superiority and the inferiority both equally fail to introduce any new specific distinctions.

We must consequently insist on the production of evidence for transmutation in the shape of actual instances in which one species has given birth to another, or instances in which variation has a properly specific character. The improved dog must be something better than a dog—the improved sheep something above a sheep—the

improved ape something of a man,—these are the sort of things wanted in the first instance if transmutation is to be believed ; and then the improved animal must show that it can propagate and perpetuate its superiority in the race to which it gives origin. There is confessedly as yet not only nothing of the nature of such evidence for the theory, but much that looks it in the face with the sternest contradiction. It is like the dream of man's immense antiquity—only the more certainly a dream the more wakefully we examine it.

## CHAPTER XXII.

## BREVITY OF HISTORY.

WE come now to wind up our examination of the argument for the immeasurable antiquity of man. We do so by directing attention to the exceedingly limited extent of human history, and also to the character of human progress as historically revealed. In pursuing our inquiries after truth, it is very necessary to beware of the misleading influence of words and phrases which have gradually and imperceptibly acquired a greatly inflated meaning. This is strikingly illustrated in the use so often made, in the argument for man's vast antiquity, of such words as "historical times," or "the age of history and tradition." Certain changes of the earth's surface have not taken place within the "historical period," or certain plants have not grown on a certain soil during that "period," or certain animals have not been known to live in a certain country since the commencement of "history." All such statements are apt to have an effect on the imagination, and through that upon the judgment, leading to conclusions not at all warranted by the amount of truth which they actually express; while that truth soberly and logically dealt with, is fitted to have an opposite effect, and even to lead inevitably to totally different conclusions.



We shall see the force of these remarks very clearly if we consider, first, the actual extent of the historical era in relation to some of the more important fields of geological inquiry, and then look to the relation of that era itself, to the controverted subject of the age of man. Let us keep in mind that the Bible view of man's time on the earth gives us 7000 years. The time embraced by the true historical period when deducted from this, by no means insignificant duration, leaves us those thousands of years during which our race has been, in company with "the flora and fauna" of the globe we inhabit, passing through unrecorded experiences such as have left nothing to tell of human existence itself, but the thin sown relics of barbarism and of death. How much then falls to be deducted from these 7000 years? Is the amount so great as to leave very little time indeed for the so-called "age of stone," together with that of "bronze," of which, as we have seen, certain antiquarian speculators are disposed to make so much? Or is it so great that far more than sufficient time is embraced by it for all that even geology reveals of man?

There are vast portions of our globe in relation to which there is as yet no historical period at all. This is literally true of all undiscovered countries inhabited now by barbarian men. Those immense regions of central Africa that have been partially visited by such men as Livingston, Speke, Du Chaillu, and their compeers in discovery, have as yet no proper history, any more than the Britons had when the Roman legions invaded these shores. The physical geography, geology,

botany, zoology, and humanity of unmeasured thousands of square miles, are all hid from the civilised intellect to this hour. The same is the case with vast portions of Asia, as well as with Africa. This class of facts may be said to give us the true starting-point of that train of thought which issues in a right conception of what is meant by the era of history.

The true thought represented by the phrase "historical period" is in reality a most variable affair. It contracts and expands to an astonishing degree as we pass from one field of geological investigation to another. If we fix on that portion of the world's inhabitable surface where the age of history has gone on for some time, but is as yet most limited, we look at once to Australia. It is scarcely yet a hundred years since the coasts of that new home for millions was discovered, so that its historical era could be said fairly to begin. Its interior riches and wonders are yet only in process of discovery by historical men. "The age of stone" is there only ceasing, and the age of iron has but fairly set in. Every remark applying to Australia that embraces the phrase "within the historical period" must be taken as of the weight of less than one hundred years. We must look for the real weight of the historical period and its variations, as affecting geological argument, to other fields. For example, how much does it embrace in relation to the one half of the habitable parts of the globe as that is found on the continent of America? Columbus set foot on that continent and actually commenced its historical age only in the year 1492. This gives America 372 years as the entire

extent of its historical period. So far as that vast continent is concerned, man has, according to the Bible, a pre-historic scope of at least 6628 years, throughout which the changes which affected him were taking place in the world. If we pass from the soil of America to that of Egypt, and take "the earliest date on which we can rely" (as Sir Charles Lyell states the matter himself), we have "only 782 years before the Christian era." That gives us 2636 years for the valley of the Nile, over against 370 for America, but it leaves us even there 4364 for pre-historic man. This gives us an idea of how very vague the meaning of the phrase "historical period" may be, and shows us how necessary it is to keep its true local signification ever in view. When used in reference to anything American it means only 370 years, when used of anything Egyptian it may embrace 2636 years. And when used in relation to other parts of the earth's surface its meaning varies with the shorter or longer time during which any particular spot has been known to historic men.

The historical period in relation to our own island is at the utmost only 1920 years. Strictly speaking it is more than 150 years short of this. If we, however, take it at the longest it leaves 5080 out of the 7000 of man's days on earth for all the changes to be accounted for, so far as Britain is concerned. The Romans, when, in the year 55 before Christ, they landed on British ground, really commenced the historical era for these Isles. They found only painted barbarians, incapable of history, in the land. When, therefore, any use is made of the fact that no plants or

animals of certain species have been known in Britain within the "historical period," though such are known to have lived in the island along with man, it must not be forgotten that there were 5000 years before that period began, according to Bible history, during some of the 50 centuries of which those plants and animals might have scope enough to live and die beside members of the human family. On the continent of America, not only one, but many races of men, have all but vanished from the earth, and new races have effectually taken their places in the brief space of 870 years. What, therefore, may we not believe possible in 5000 years on such a stage as is furnished by the narrow surface of Britain?

If we cross over to France and take the extent of the historical period of ancient Gaul, it is not 50 years longer than that of our own island. It falls decidedly short of 2000 years. This again leaves 5000 years of a pre-historic era for men on the continent on this side the Alps and Pyrenees, where so many antique relics of our race have been found. The same measure applies to France, Belgium, and Denmark, and still more strongly to more northern countries, in which, too, so many arguments for man's imaginary age have been supposed to be discovered. It was not, indeed, till 100 years after Christ was on the earth, that the progress of discovery made the historic peoples acquainted with the state of Europe north and west of Italy. Such history as gives a reliable account of the state of that vast region does not carry us back 1800 years. It leaves us above two centuries over the 5000 for all changes affecting

humanity previous to these regions being known to civilised men.

Sir Charles Lyell is himself deeply impressed with the brevity of the historical period. He says, "True history and chronology are the creation, as it were, of yesterday." He remarks, even in regard to ancient monuments and inscriptions, "none of them seem to claim a higher antiquity than about fifteen centuries" before Christ. That would leave us well-nigh 4000 years of man's age on the earth, according to Bible history, still to be accounted for, and that even in the case of Assyria itself. As the shortest, then, we have, in Central Africa, discovery now going on, and only commencing the "historical period" among hitherto unknown and vast regions, peopled by barbarous tribes; and as the longest we have the most distant date to which even monumental records will carry us—about 8000 years. This gives us a sum, rising from nothing up to three thousand, as the utmost reach of all that can be called history, and, consequently, from 4000 up to 7000 years, as the time for changes on which geology and other archæological systems of inquiry may give us light. If the reader will take the trouble to master the idea of duration embraced in even the shortest of these vast periods he will be profitably impressed with the truth that great changes may well be believed to have affected humanity during the long procession of four thousand years.

This, however, brings us to the second part of the special subject at present in hand. The period of history which we have thus somewhat

carefully considered has, even in its brevity, a most important relation to the great question at issue. How comes it that this historical period is so short if the age of man on the earth is really something like 500,000 years? This is surely a very suggestive question, to say the least of it. And Sir Charles Lyell is not, we think, indifferent altogether to its importance. He says, "We see in our own times that the rate of progress in the arts and sciences proceeds in a geometrical ratio as knowledge increases, and so when we carry back our retrospect into the past we must be prepared to find signs of retardation augmenting in a like geometrical ratio, so that the progress of a thousand years at a remote period, may correspond to that of a century in modern times. Man would more and more resemble the brutes in that attribute which causes one generation exactly to imitate in all its ways the generation which preceded it." Let us see how much this sort of reasoning is worth. It is clearly intended to account for the shortness of "the age of iron." In estimating the force of the argument we ought to keep away from that portion of mankind which has had the light of the Bible. We must look at humanity in its barbarism, and ask if it is a fact in history, or in anything else, that the human race, in any of its barbarian families, has ever been known to advance from barbarism to civilization, as the result of its own capabilities of improvement? Have the allophylians, as they are called, the pre-historic peoples of Europe, or of Asia, or of Africa, or of America, or of Australia—emerged from their savage state and become civilized men

during even the lapse of the fancied ages of the geologist who assigns them such vast antiquity? Have they not all retrograded till they became extinct, so far as past races are concerned? We appeal to all the sources of human knowledge for the answer. Are not these races, in every case, now declining, so as to promise their extinction, if not saved by some superior power altogether external to any found in themselves? Sir Charles's argument reminds us of the Irish lad who was one day too late for school, and told the master that the road was so slippery that for one step he took forward he went two backward. "How then did you ever get here?" said the puzzled teacher. "*I turned and went the other way,*" was the ready reply. So Sir Charles's ancient men must have progressed in their retrogression in some such mysterious style. And yet it seems as if we must surrender all claim to logical capability and "culture," unless we let ourselves be carried away with the stream of such melancholy speculation!

Let us look seriously at the facts. There is not an instance of barbarian men even so much as keeping their ground in intellectual or moral standing on the face of the earth. No writers urge this fact more strongly than do those of the school to which Sir Charles Lyell now belongs. Indeed he himself always supplies us with very striking and satisfactory evidence by means of which to refute his own theories. As most appropriate to the present case, he refers us to instances to which we have already turned attention for another purpose—that is, to the "pictures on the walls of ancient temples in Egypt, in which, a thousand

years or more before the Christian era, the Negro and Caucasian physiognomies were portrayed, as faithfully, and in as strong contrast, as if the likenesses of these races had been taken but yesterday." Here is the Negro race proved to have failed to make the slightest advance in 3000 years. If there is *no* progress in 3000 how many thousands of thousands would it take to bring such a people as now inhabit the undiscovered African plains to equal those "Caucasians" to whom they formed so striking a contrast of old? What can be the use of assuring us that it must take an immense lapse of ages to enable *nothing* to grow, and yet so to grow as to continue nothing, but in the end to become a very great thing indeed? The argument, as we have seen before, kills itself by proving too much.

There is but one power known to man that has ever succeeded in elevating the barbarian so as barely to save him from extinction when in contact with civilization, and even that fails to rescue a truly savage people as a whole. The gospel and spirit of Christ, in so far as they have been brought to bear on barbarian men, have proved salvation and elevation, even in the purely earthly sense of these terms. Christian missionary influences are now fringing the African continent, and in a few spots dotting it here and there with a visibly advancing civilization of the true descendants of savage peoples. The same element which has preserved and increased the intellectual and moral excellence of the really ancient East is, as a matter of scientific fact, preserving and increasing that excellence wherever the same power is taking



effect. Apart from this, it is not possible to find anything that can be imagined to indicate even a tinge of improvement in human nature. We make this statement in the spirit of pure science, It would be infinitely unworthy of that spirit to assert such an idea as fact if it were not fact in reality; but it is every whit as unworthy of the name of science to overlook it as if it had no existence in truth, and to dream and maunder amid conjectures which all real fact repudiates and denies. Apart from Christianity and its conserving and elevating power, no well informed man will risk the sober assertion that there is any evidence of the slightest degree of spontaneous improvable capacity in barbarian man such as might secure his civilization in the course of ever so many ages.

To be fully convinced of the truth of the statements we have thus made, it is necessary only to glance at what man in his barbarism really is. Look at the aborigines of Australia, and even of New Zealand, apart from the gospel's power. Look to the red men of North America. Look to the hordes of China and Tartary, or to any of the other inhabitants of Asia. Where is the evidence that any amount of ages could possibly witness anything else than their disappearance from this world if left to their own elements of even material improvement?

Sir Charles Lyell argues, that if man had been created (as the Bible teaches) a superior being at first, his progress even in far far distant ages would have been such that we should now be digging up the most wonderful specimens of art,

and the most perfect results of science, instead of the ill-formed flints of the savage! But what, in the face of the actual facts of the case, is such an argument worth? Let us admit that man was created at first with only the *least conceivable modicum* of real progress in him, how should 500,000 years find him only getting the length of flint knives and arrow heads, and then disappearing from his earthly home in common with the "extinct mammalia" who lived along with him? How should every relic of his existence tell us that he died, not improved, but degenerated everywhere, except where the Bible (which Sir Charles does not condescend even to mention) was present to regenerate his soul? Moreover, how after 500,000 years should man be found, as he is on the banks of Australian rivers in his truly savage state, using his flint tools still? The very rudest relics of Sir Charles's most distant imaginary antiquity—those found embedded with, or even sticking fast in the bones of the most ancient of extinct quadrupeds—are fairly matched by similar tools in actual use, if not now, at least within the last very few years. How is it, if savage man advances towards civilization by ever so slow a progress, that he is thus found, after all the immeasurable ages imagined, not advanced in so much as the minutest fraction of a degree? Is there not, then, evidences of some strange bewilderment of idea in the reasonings of this most industrious and honoured of geologists?

The truth is, the old and exploded notion of *developement* has got hold of Sir Charles in his advanced years, and he cannot shake off the spell.

He must imagine the gradual improvement of terrestrial beings by transmutation in the face of millions of facts demonstrating that the law of species has not been to improve as ages fled, but to degenerate, till one after another of the most ancient became extinct. All the facts of the case show that this law has been that of men when they fled from the Central Light, just as it has been that of the lower creation. If, for example, we take the case of America, we have its present inhabitants, who have poured into it, and over it, during the last 870 years—we have beyond these the Indian tribes who preceded the white races—then beyond these we have the mound-builders of the Mississippi valley, and the copper miners of the Ohio\*—beyond these, nothing. The mould-builders degenerated and passed away. The copper-miners mysteriously disappeared as if by the Flood. The Indians degenerated and are dying rapidly out on the approach of white men. If the present races were to leave the Bible, and fall into the track of those who peopled the continent before them, what reason have we to think that they too would not degenerate and pass away? But all this perfectly agrees with the history of that stream of human elevation which is visible during at least 3000 years, in the wake of Bible truth. It is utterly inconsistent with the theory that man has risen slowly from barbarism in the course of previous ages, however much we extend their fancied duration. It goes all to prove the Bible history, and all to disprove those conjectural systems which are

\* See Wilson's "Pre-Historic Man," a book of good value.

opposed to it. Sir Charles imagines an infinitesimal degree of improvement, raising one generation of barbarians about as much above another, as he fancies the Nile to raise its delta in a season—that is, by the thickness of an almost impalpable film, so that the age of stone passes at length into that of bronze, and that of bronze into that of iron in the course of incalculable ages; but his fancy is belied in its very essence by the sternest facts. The Australian native may be regarded as shaking his stone hatchet in the face of the dreaming philosopher, and laughing him to scorn as he sinks into the final tomb of his aboriginal race. Whether the life of that race has been through a series consisting of a few centuries, or of many thousands of years, its progress has never carried the savage man beyond that stone axe, or elevated him, even by an infinitesimal degree in the mental or moral scale. The same is true of all other barbarian races, so far as they have been allowed to develope themselves. Where bronze has succeeded stone, or iron has come on bronze, among such people, it has been intruded by another and nobler race. The Red Indian has got his firearms—so has the negro in the African wilds—but only from their being introduced from beyond the limits of the barbarism in which the poor child of degradation has lived on without a solitary sign of self-development. It is far worse than useless in the face of all history and of all pre-historic indications also, to dream of an almost infinitely slow advancement, when it is so irresistibly clear that there has been only the opposite in every case of barbarian man, and that, too, when such dreaming

tends to destroy the faith of many thousands in the unspeakably precious testimony of God.

Let us, then, distinctly understand what the historical period really means—a period at more than one part of the world not yet begun, and at the most ancient spot on the earth's surface, even if we go back to its earliest dawn, not exceeding 3000 years. Keep clearly in mind that this period, when deducted from the Bible sum of the human period, in the case of some countries, leaves us all the 7000 years of the life of man on earth, and in the country known to possess the earliest in its records, leaves yet 4000 years of true pre-historic duration—that is, if we keep away, as Sir Charles Lyell most scrupulously does, from all reference to Bible history. And let the fact, that the written records of mankind are yet so very brief, have its due weight with us in relation to the fantastic thought that our race has been slowly emerging from the condition of the brute creation during thousands of centuries. If there ever was a wild notion in the human soul, it is that which gives us some half a million of years as the age of human elevation, and yet a written history of even the most elevated of mankind, covering only about two thousand five hundred of those years. Singularly strong must be the desire to believe such a notion, which overcomes all the repulsive force of its monstrosities.

## CHAPTER XXIII.

## CONCLUSION.

IN closing our discussion of the Age of Man in relation to the Bible, it may be well to notice that grand subject-matter of Scripture which gives all its value to the issue of such an argument. How is the Bible so precious that its truthfulness is of such importance to men? Might we not get on altogether as well with that natural theology, and that anthropological system of ideas which are consistent with the rejection of the sacred Scriptures? Do not men live and die in a state of infidelity to the Bible, who live and die as well as could be wished for men? Does the full belief in the truth of the Bible lead to anything of such superiority in the lives and deaths of human beings as warrants the labour and anxiety expended and endured in such work as you have undertaken? These are reasonable questions, and they ought to have a satisfactory reply.

It must be observed that Natural Theology has never really benefitted the mass of the people who have been left to its unaided influence. It is matter for fair scientific inquiry whether the influence of the Bible, or that of what is called Natural Theology, has really proved most beneficial to humanity at large. Will any man risk

his reputation for honesty and intelligence on the statement that Natural Theology has had a more powerful and beneficial influence on the masses of mankind than that which has been exerted by the Bible? Or, will any one mention the people who have rejected the Bible and taken to the so-called religion of Nature who have had reason to rejoice over the step they have thus taken? Or will any one tell us of the man who was imbued with real Bible truth and who surrendered that, betaking himself to mere Natural Theology, who became a better and happier man for the change? These are all fair questions, and the truth compels us to reply that while millions have become virtuous and happy individually, and civilised and powerful socially, by belief in Bible ideas, mere Natural Theology tries in vain to point to one such triumph. Nor is it difficult to see why the matter is so.

It is by the Bible alone that we learn of the heart of God. He who has got his ideas of the glory of the divine goodness from the Bible may find them expanded and confirmed by certain intimations of Nature; but he who rejects the Bible and has not learned its revelation of Jehovah's true character is ever at sea on this momentous subject of thought. The true Bible ideas of God as the infinitely loving Father of every human being—showing that his living, loving heart is set upon the good of every one of his vast family—teaching as they do that he would rather bear even the curse deserved by guilty men himself than have the criminal to bear it,—that he counts the very hairs on the head of man,—that

he sympathises with every sorrow of the human heart, and seeks as the creating mind the fellowship of the minds he has created capable of such fellowship,—these ideas of God, for which we depend entirely on the Bible, are of incalculable value. He who has taken care to observe their effect on human experience and character with one tenth of the interest with which a geologist searches for a new fossil is inevitably aware that no greater calamity could happen to man than that which would be involved in the destruction of his belief in this sacred book. That God feels to the spirit of man as the prodigal's father feels to his poor guilty child, only with all that enhanced love by which the divine heart rises above the human, is a truth of the Bible alone, and millions of gold never did, and never will do, for a human being what that truth always does when received.

It is by the Bible alone that we learn of a God-provided propitiation. The human conscience seems capable of condemning the guilty by nature's light alone. Not that it condemns all guilt, or can really distinguish clearly between virtue and sin, but it does terribly distress the guilty spirit when its power is once brought to bear. Severed from Bible teaching men have recourse to most fantastic and fruitless methods of meeting this ruinous self-condemnation. The "mere mercy" to which certain scientific minds have recourse as sufficient to set the guilty soul at rest is not an idea of Natural Theology. It is not found with the savage, or with the purely heathen. It is a partial truth borrowed from the Bible by those



who take part but reject the rest. This idea of mere mercy goes for very little among the great mass of men in the hour of their deepest need. *Justice* such as inflicts the penalty of guilt has a strong hold of the natural mind. But such a thought as that the living God himself would take that penalty from the head of the guilty and bear it himself in their room is utterly foreign to all but the Bible-taught. He who has seen the trembling one about to enter the unseen, yet heavy with the consuming thought of his responsibility and guilt, and who has seen him fully relieved by means of the simple gospel of Christ's propitiation, will never fail to feel the tremendous loss that accrues to the man from whom Bible faith is taken away. The gratification which, for a little time, arises from scientific notions and an imagined superiority over the superstitions of the vulgar, is purchased at a tremendous cost by him who gives up his belief in Christ's sufferings for his soul in favour of that which destroys his faith in the Bible.

The enjoyment of the forgiveness of our sin by God, in view of the propitiation of Christ, is dependent entirely on the truth of the Bible. A delusion is a fact. That may not be a fact in which a deluded man believes, but his delusion is a fact, and if you should regard the belief in God's full and honourable forgiveness of sin for Christ's sake as a delusion, it is a very wonderful delusion indeed. It is in itself a fact, whatever you may think of the reality of that to which it is related. We have seen the knitted brow and the bloodshot eye of the guilty take on the expression

of ineffable gratitude and peace when the thought of God's forgiveness for Christ's sake entered the mind. That expression indicated a fact of the most delightful character. The removal of belief in the Bible would have reversed that fact, and have cast the soul back into agony. Is it not, then, of incalculable moment that we should establish that belief? Would it not be immeasurably to be deplored if it should turn out that for the guilt-stricken soul there is nothing better than the dim and uncertain dreams of what passes for religion among those who repudiate the sacred Scriptures? No one who knows anything of the terrible experiences of the dying can be doubtful on these momentous concerns.

But it is not only in the experiences of the individual soul that we see the importance of the truths of the Bible. That social distinction which marks off the civilised among the nations from those who may be regarded as comparatively savage, depends on the popular confidence in the Scriptures. If we value the freedom which the Bible has never failed to secure to the slave, and have any idea of what that implies as contrasted with the evils of his bondage, we cannot but be deeply concerned for its truthfulness and its claims to Divine authority. The slaveholder, when intellectually cultivated, invariably leans to theories like those of Darwin. He keeps the light of Scripture far away from his own mind, but especially from the mind of the bondman. That full equality—the “one blood” of all nations of men who dwell on the face of the earth—and still more the Heavenly Father's in-

tense interest in every human being, in whatever colour or clime, which the Bible so strongly teaches, must ever be fatal to slavery. Put aside the Bible, and let the speculations of so-called science take its place, and that equality of men and deep interest of God fade from the general mind. The consequences have ever been such as every right heart must deplore. Again, if we value the marriage relation as a thing having the sanction not only of merely human law, but of God himself, with all the consequences which its sacredness involves, we necessarily cleave to the Bible. Throw off the influence of that book, as the Word of God, and you have nothing of any real weight in its stead by which to bind the consciences of men in this momentous affair. Then there is the Sabbath, or weekly rest, so incalculably valuable to man and beast, when it is observed under the high authority of God. That dwindles into a wasteful day of mere frivolity, or degenerates into a day of ordinary toil, as soon as the Bible loses its hold upon man. So might we write of everything that makes society virtuous and happy in the true sense of the term.

When we take these things duly into consideration, we cannot but feel grateful in the strongest degree, that the more fully we search over the whole field of truth, the more evidence we gather in defence of the Divine Authority of this wonderful book. The men who seek to undermine this authority, and imagine that they are doing their fellow-men a great favour by exploding all belief in the volume as the word of God, even when their intellectual strength is gigantic, are found to

be mere dreamers when duly taken to task. Well may every soul be glad that it is so. Whether we consider this passing life, or the hopes that reach away beyond the grave, with the life and immortality brought to light by the Saviour in the gospel, we must rejoice over every sure establishment of the verity of this precious word.

Nor should we fail to mark the responsibility which goes along with favours so precious, and which ought to be kept in mind when we are most grateful. That it should be possible for any one so to know God as to repose in his undying love—so to know Jesus Christ as to rest in his great propitiation, and so to know the Holy Spirit's teachings as to be conscious of divine enlightenment ever streaming from the sacred page upon his soul, can never be rightly separated from his obligation to make the most for himself and his fellow-creatures of the privileges thus granted him. May it be ours, then, to learn as God has taught—to bless in some degree as God has blessed—and at length to rise to that bright world for which this life is but the preparation, when we spend it or even when we end it aright.













